KPMG

Smart Cities: Funding a more Livable Future

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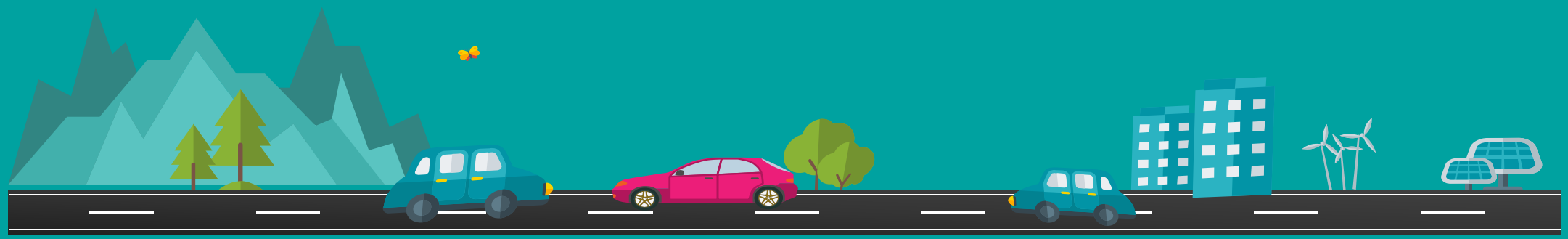
Today's Presentation

1. **What are the trends: The changing face of municipal infrastructure**
2. **Where to invest: Maximising value from your investments**
3. **How to pay for it: Funding and financing Smart Cites**



The Pace of Change

Question 1

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Between 3 and 5 days!

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Question 2

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560 times as many: In 1991 there were about 16 million subscribers of wireless devices in the world. In 2019 there are close to 9 billion (on a planet of only 7.7 billion human beings)

The Pace of Change

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9 times : In the year 2000 the ASP was approximately $3.5 and in 2019 it is approximately $0.38

The Pace of Change

Question 4

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0.5% of all data is ever analyzed and used. Imagine the potential if we made better use of this data!

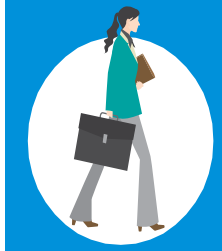
1. What are the trends: The Changing face of municipal infrastructure

Current municipal challenges

Budgetary constraints….

…tighter spending, aging infrastructure, shifting priorities

Mass urbanization….



…creating capacity issues in housing, transportation, social care….

Climate change impacts…

…significant risk exposure and mitigation costs to Canadian cities

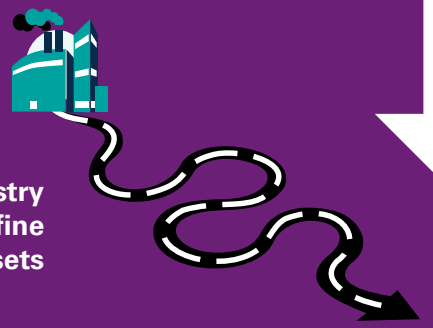
Technology….

…opportunity or threat…..disruptive technology or just disruption?

…faster, easier more efficient services demanded

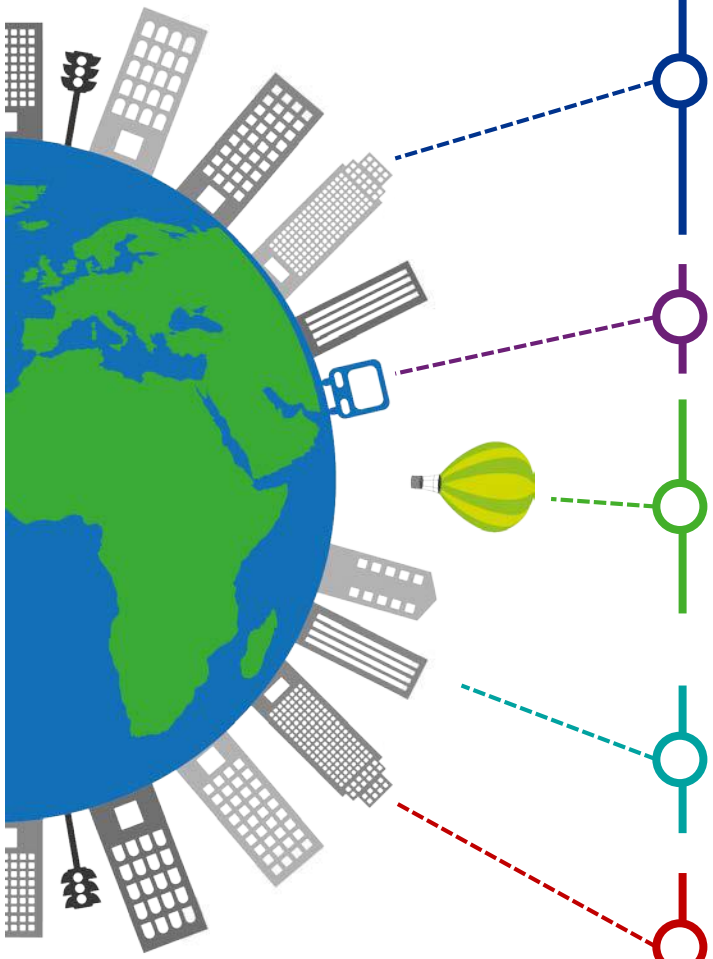
Increased citizen expectations….

Changing workforce…



…cross-industry disruption will re-define traditional skillsets

What is a Smart City?



"a city that **monitors and integrates conditions of all of its critical infrastructures** – including roads, bridges, tunnels, rails, subways, airports seaports, communications, water, power, even major buildings – can better **optimize its resources**, plan its preventive maintenance activities, and **monitor security aspects** while **maximizing services to its citizens**"
- U.S. Office of Scientific and Technical Information

"an **instrumented, interconnected and intelligent city**" - IBM

"The use of smart computing technologies to make the critical infrastructure components and services of a city – which include city administration, education, healthcare, public safety, real estate, transportation and utilities – more intelligent, interconnected and efficient" – Forrester Research

"Smart Cities use information and communications technology to enhance their liveability, workability, sustainability and attractiveness"
– Smart Cities Council Readiness Guide

"A smart city is a city that harnesses **data and innovation in technology** to make a city more **liveable, workable and sustainable** for its **citizens**." – Chris Sainsbury, KPMG

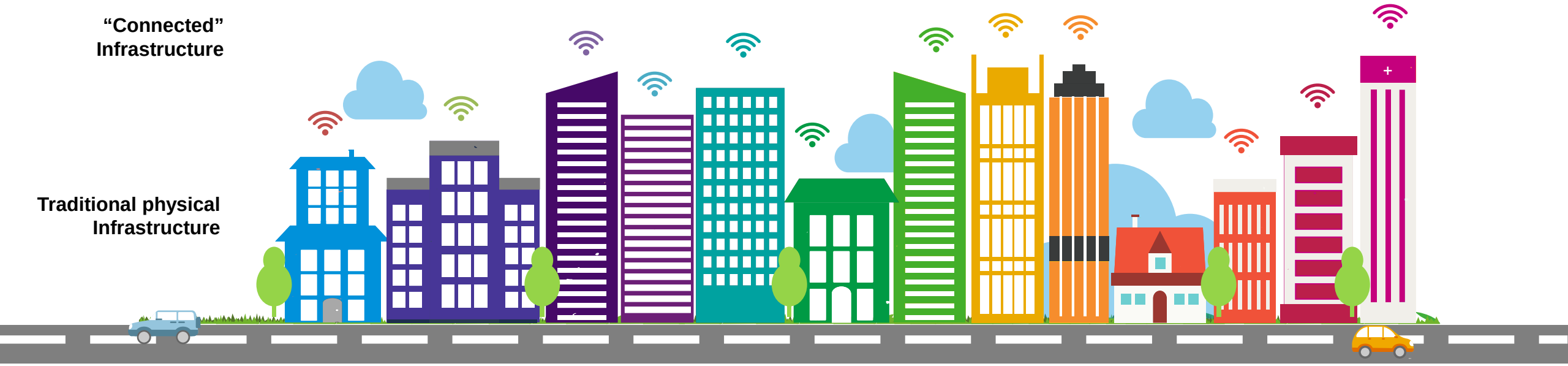
Smart City Layers

Traditional physical Infrastructure

Smart City Layers

“Connected” Infrastructure

Traditional physical Infrastructure



Smart City Layers

Outcomes

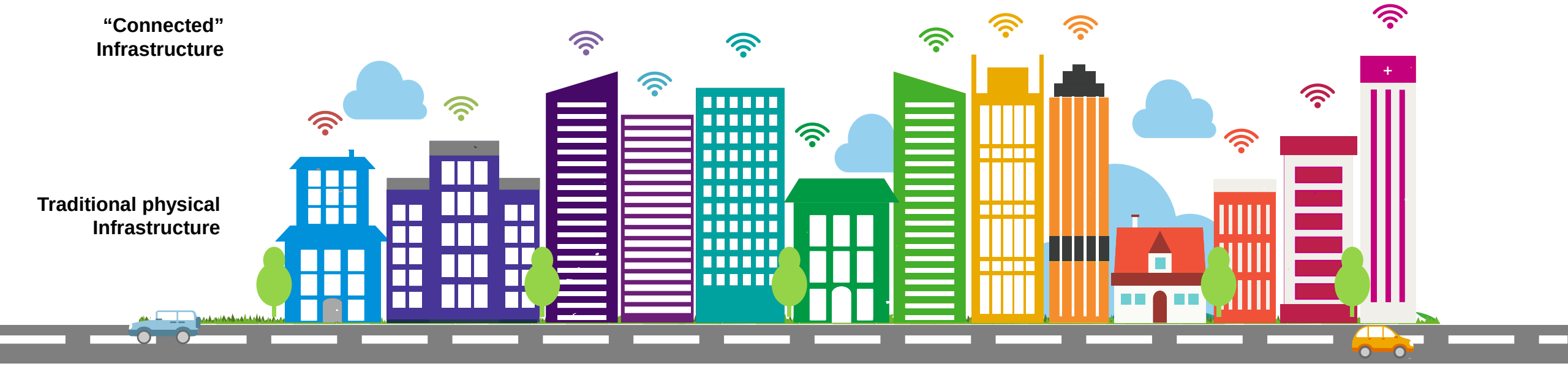
- Citizen Experience
- New products and services
- Cost savings
- Operational and process efficiency
- Asset utilization
- Data insights: predictive and preventative

Service Applications

- Transport / Mobility
- Recreation
- Environmental Stewardship
- Utilities
- Safety / Security
- Public Health
- Education
- Economic Development
- Community
- Justice
- Social Services
- Culture

“Connected” Infrastructure

Traditional physical Infrastructure



Challenges of paying for Smart Cities

- Budget constraints
- Limited expertise and capacity
- Achieving value for money
- Policy hurdles and project prioritization

2. Where to invest: Maximising value from your investments


We need to drive technology and not let technology drive us
NEW TECHNOLOGY
AI, VR, BLOCKCHAIN
BIG DATA, ROBOTICS

Understanding your priorities

Vision

Vision, Goals and Objectives

Societal Benefits

- Livability
- Sustainability
- Safety
- Economy
- Accessibility
- Culture & Services

Outcomes

- Access to services
- Improved environmental sustainability
- Lowered crime rates and safety for all classes of citizens
- Cost savings and economic gains
- Connectivity and availability
- Operational and process efficiency

Services

- Transport / Mobility
- Recreation
- Environmental Stewardship
- Utilities
- Safety / Security
- Public Health
- Education
- Economic Development
- Community
- Justice
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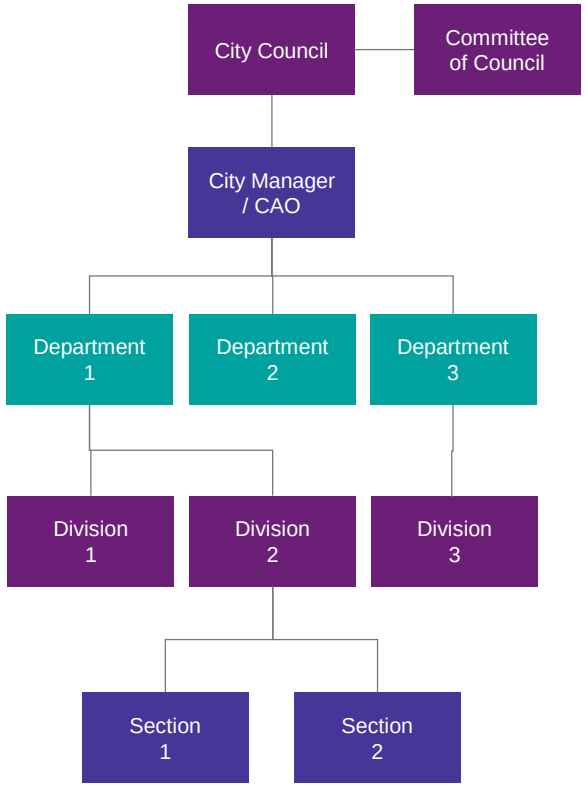
- Culture

Citizen-centric

Focus on services: city innovation practices are service-based, rather than organization-based

Current Method of Financial Planning and Budgeting is Problematic

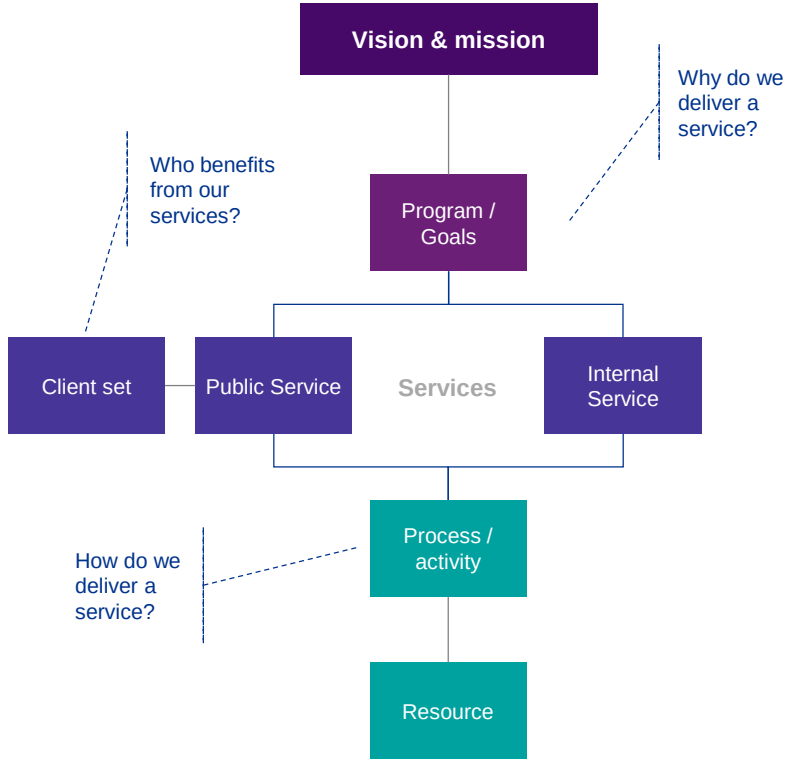
1 Organizational model



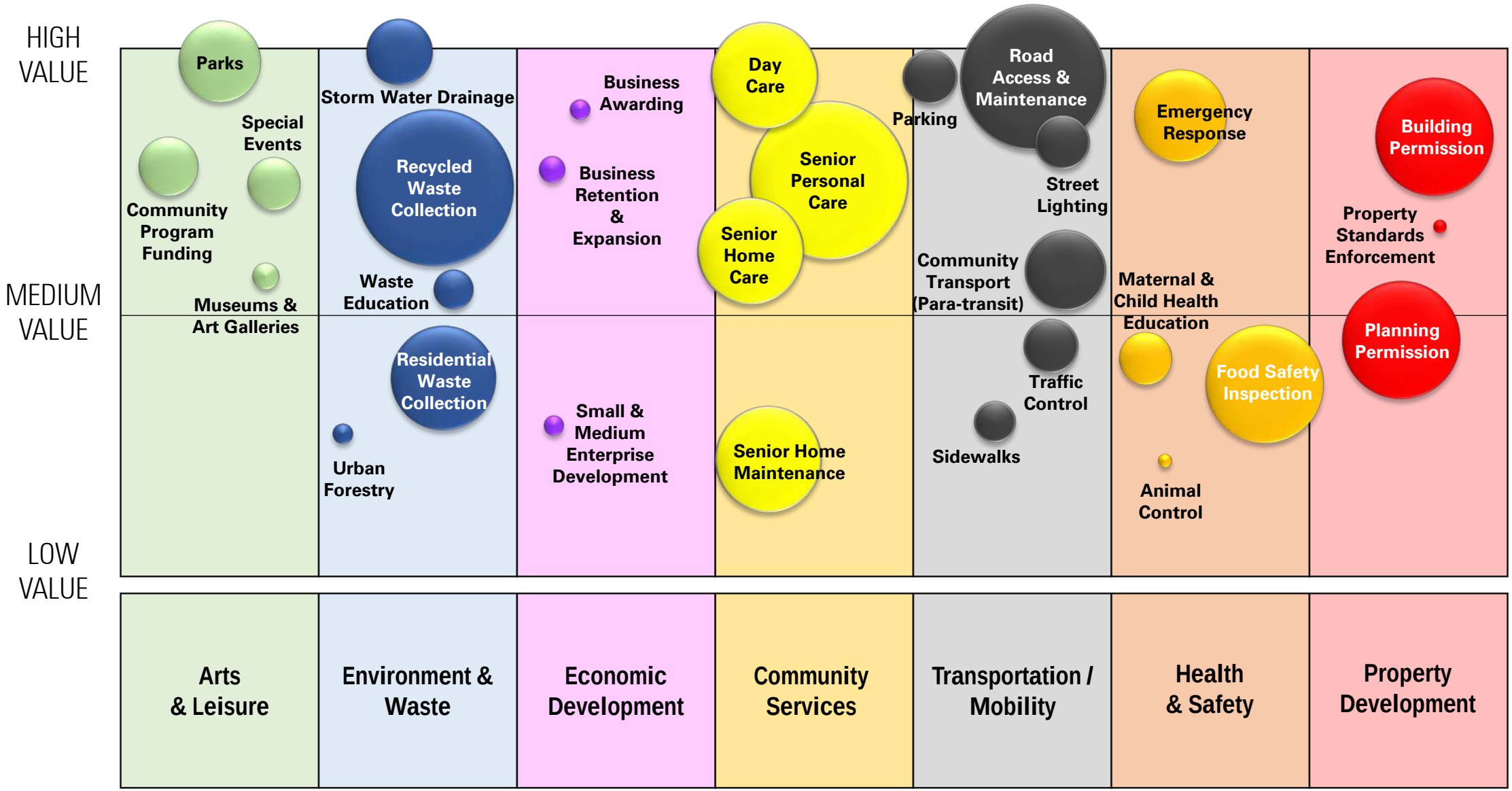
Source: open data, KPMG Analysis

Service Based Budgeting provides a more useful "Cost of Service" view

2 Service model



Understanding where value lies



Measuring value

KPMG True Value approach

- Identifying and quantifying externalities
- Express all financial, social, and environmental impacts in a common financial metric
- Can help to determine prioritization and justification of Smart Projects

Economic

- Travel time
- Wages
- Tax incentives

Social

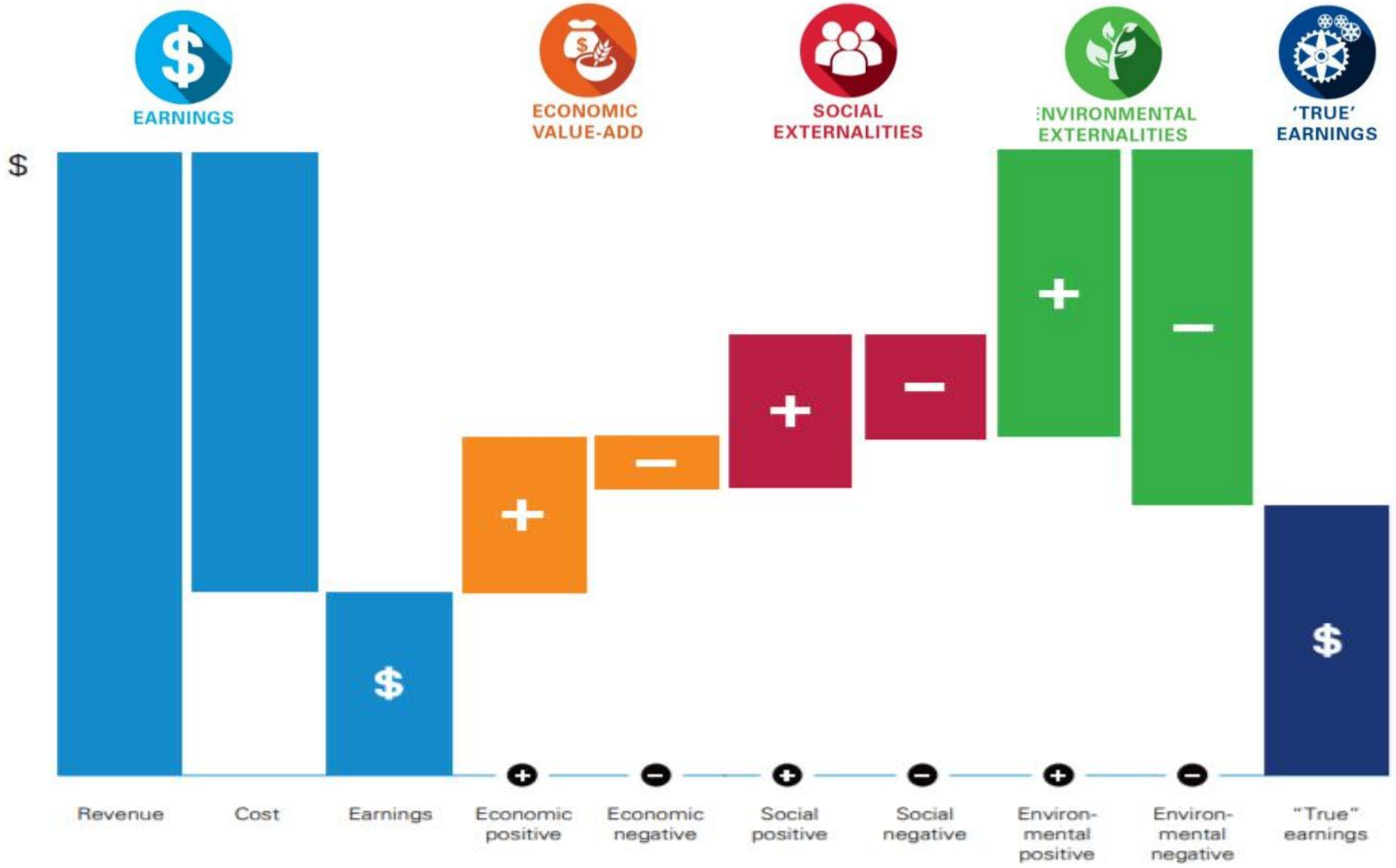
- Health & safety
- Cultural institutions
- Congestion

Environmental

- GHG emissions
- Resource use
- Energy use

True Value example

Measuring the positive (+) and negative (-) impacts of a project / investment



Creating more value for society

Core benefits of the True Value approach:

1. Improve decision making
2. Enhance reporting and strengthen relationships
3. Build the business case for innovation

3. How to pay for it: Funding and financing Smart Cities

Funding vs financing

Funding: how you ultimately pay for it over its lifecycle.

Financing: how you meet the upfront costs of building the infrastructure.

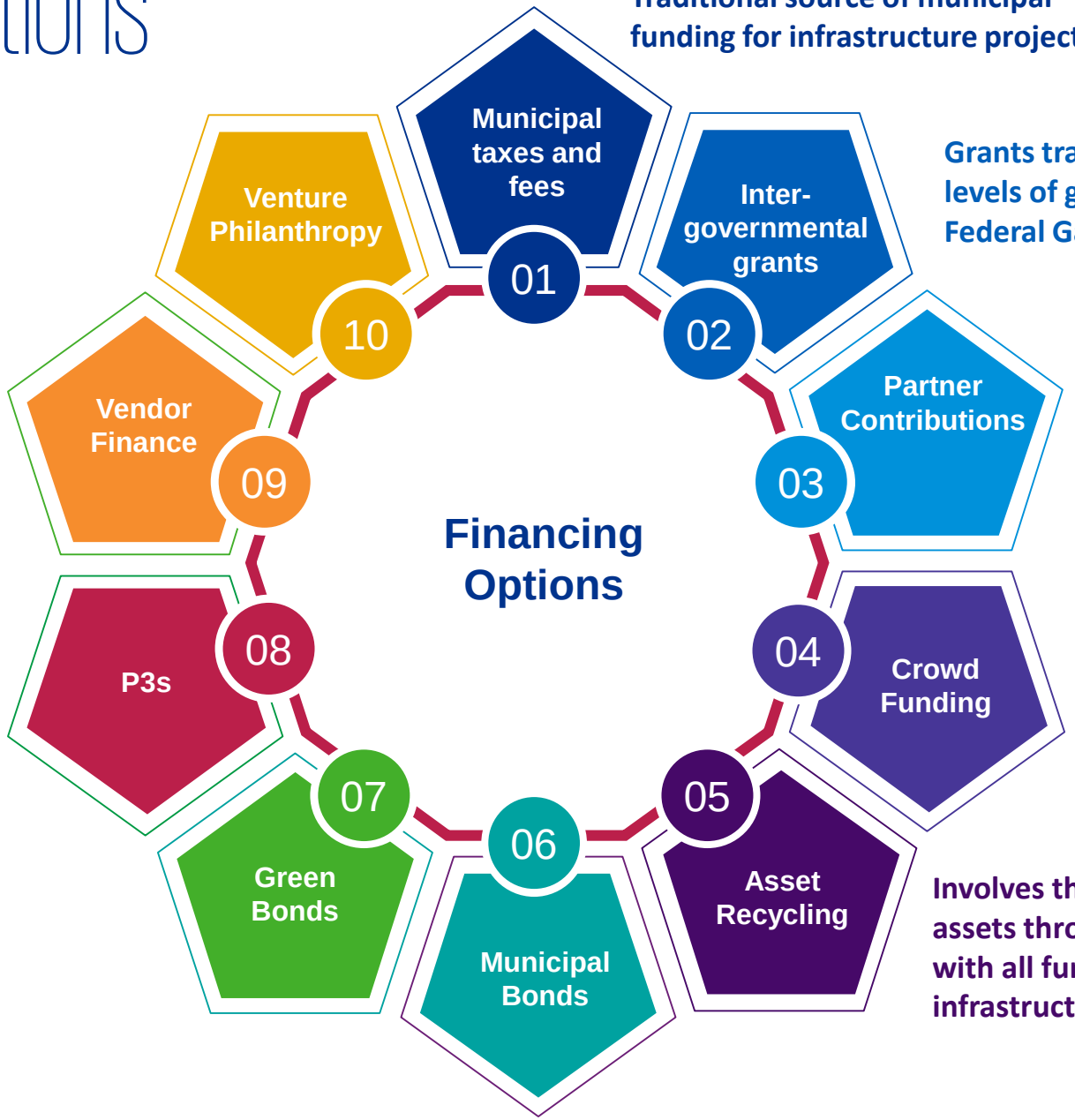
Funding options

Monetize value created

Link revenues to expenditures

Funding tool example		Identifiable benefits
User fees	→	Identifiable beneficiaries (tolls, transit, water)
General taxes	→	Collective benefits (parks, fire protection)
Land value capture	→	Increase property values (transit)
Development charges	→	Growth-related costs (sewers, roads)
Intergovernmental grants	→	Spill over municipal boundaries

Financing Options



Traditional source of municipal funding for infrastructure projects

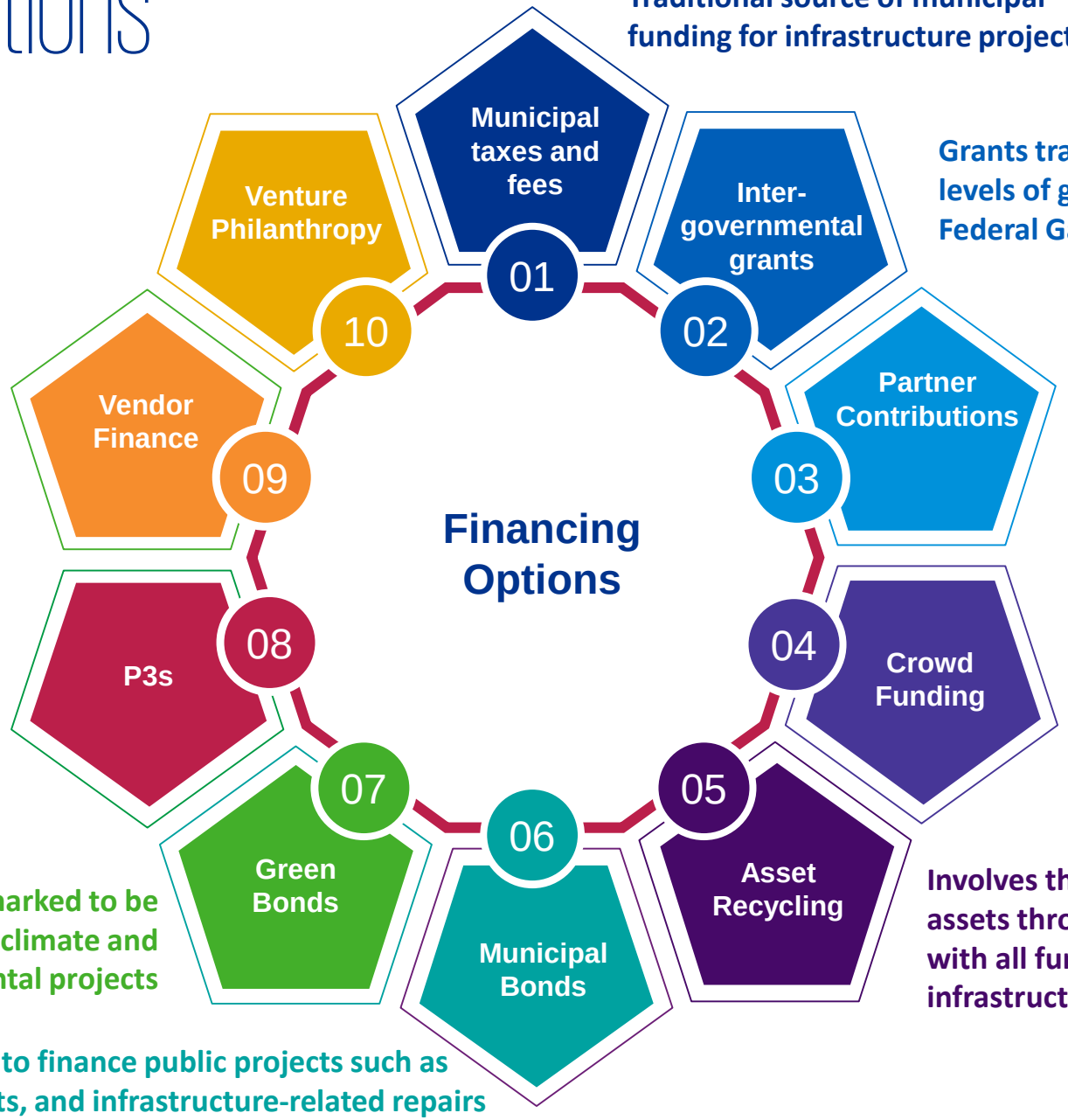
Grants transferred from other levels of government (e.g. Federal Gas Tax Fund)

Financial contribution from partnering organizations (e.g. Transit / Power authorities)

Financial model through which citizens, in collaboration with government and local authorities, fund projects to provide a community service

Involves the monetization of existing public assets through sale or lease to the private sector, with all funds received being reinvested in new infrastructure

Financing Options



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Bonds specifically earmarked to be used to benefit climate and environmental projects

A bond issued by local government to finance public projects such as roads, schools, airports and seaports, and infrastructure-related repairs

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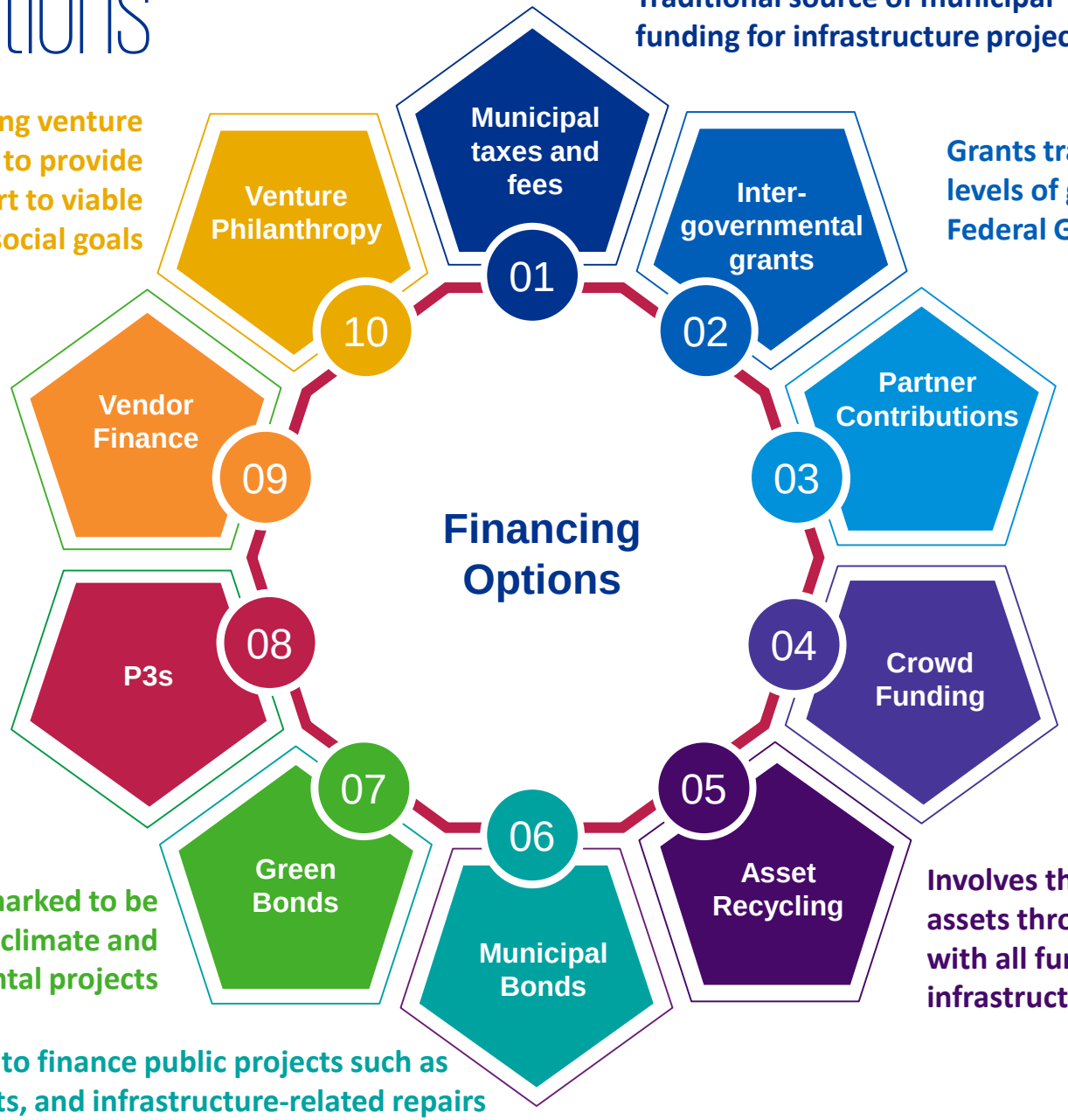

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Public private partnerships leverage private financing and expertise to get smart city projects off the ground

This is when an equipment vendor offers financing for a project

Private investors using venture capital approaches to provide financial support to viable projects with social goals

Fostering an ecosystem for Smart Cities

Promoting Smartness

- Clear vision and direction
- Citizen-centric development
- Clear focus on services
- Structured approach to prioritizing investments
- Incentivizing positive social/environmental impact
- Create a long term financial plan and model
- Consider the financing options: pros and cons
- Establish an ecosystem: municipalities, local government, citizens, private sector

Questions?

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