Smart City Transformation Roadmaps: Delivering Better Financial Governance and Management

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Our focus for the past 33 years:

Transforming the world by helping organizations to plan, build and operate critical assets

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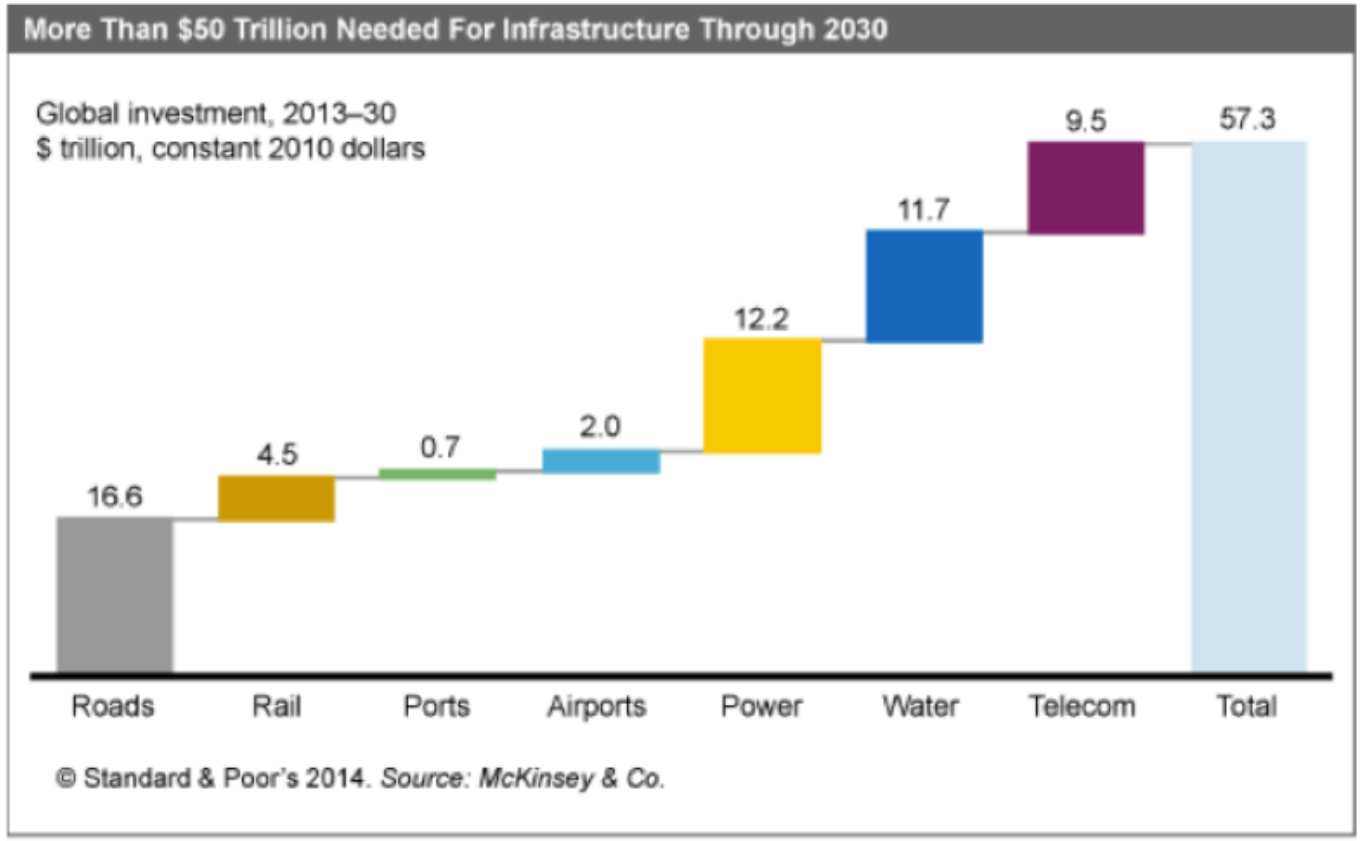
Global Infrastructure Development Market



An estimated $57 trillion will be needed to finance infrastructure development around the world through 2030, according to a report from consultant McKinsey & Co

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An urgent need for improvement in infrastructure delivery

Capital wasted due to poor project selection

7%

Capital wasted due to poor project execution

14%

Capital wasted due to poor maintenance

7%

Source: McKinsey Infrastructure Practice, *Infrastructure productivity: How to save $1 trillion a year*, January 2013

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Why focus on infrastructure development

Use infrastructure as a catalyst for economic development

Cope with rapid urbanisation and improved service delivery objectives

Promote regional integration and develop economic corridors

Correct historic underinvestment in infrastructure and maintenance

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Challenges in infrastructure development

Where to invest?

How much to invest?

Securing funding

Long duration projects

It is like running a temporary business

Multiple stakeholders across many organizations

Lack of real time visibility in overall project performance

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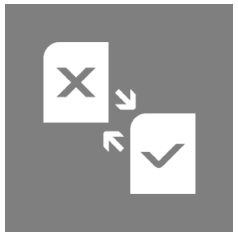
Negative outcomes in infrastructure development



Cost increase due to uncontrolled scope and contract changes

Schedule delays due to resource and materials constraint

Payment disputes due to incorrect invoicing

Delay in ramp-up to full capacity

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– Every day, urban areas grow by almost 150 000 people, either due to migration or births.

– *Are you ready for this influx of residents?*

White Paper

IEC

Orchestrating infrastructure for sustainable Smart Cities

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Our Value Proposition

Improve infrastructure productivity to build better lives for all citizens!

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A city is a city, is a city?

Our focus areas

- Metropolitan regions
- Clusters of Cites
- City
- Counties,
- Group of Counties,
- a town,
- a district,
- or a township

Responsibility of the city

- The development of the “Smart City”, to provide services and infrastructure to its citizens and to plan and coordinate initiatives across the responsibilities (verticals) of the city.

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Key considerations for the city administration

City Manager, Mayor, Director Infrastructure, Head of Strategy, Smart City Champion , CIO

- Do you have a solution to build the Smart City transformation roadmap, able to co-ordinate effort across all city responsibilities?
- Can you eliminate duplication of effort across the city?
- Do you leverage technology to achieve operational excellence in project delivery

CFO, PMO Manager, Municipal Manager

- Can you easily translate ideas to actionable plans
- Can you leverage project data to provide decision support analytics on key KPIs
- Can you integrate infrastructure planning with spatial planning
- Do you have financial control over project expenditure

Project Manager

- Are you managing your reputation risk across the infrastructure portfolio?
- Do you have control over contract change management?
- Are you managing vendor performance across the portfolio
- Do you have a mobile workforce

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The city's challenges

- Environmental Sustainability
- Social Sustainability
- Economic Sustainability

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Economic challenges

- To improve economic sustainability against a backdrop of
  - growing urban populations
  - decreasing financial and human resources to deliver adequate services across the city-region
  - increasing environmental and social conflicts
  - macro economic pressure
  - **and competition for public and private investment in and around the city**.

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Investment planning must eradicate inequality

- challenges related to ensuring basic human rights, dignity, safety and security for the poorest of residents while delivering on the lifestyle demands and expectations from the city's elite
- City management must prioritize certain capital and social investment to deliver on the strategic objectives of the city, a fine balancing act indeed.

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Competition for funding

- A significant challenge in the implementation of Smart City Transformation Roadmaps is related to securing adequate funding for projects
- Development Financing Institutions (DFI) and Public Private Partnerships (PPP) indicate that adequate funding is available to realize smart city transformation goals
- But they have two main investment decisions to consider:
  - The availability of investment grade project opportunities
  - The assurance that adequate financial control and governance processes are in place during the project implementation phase.

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But……

How will these transformational projects be delivered?

The multi-billion dollar question asked by many public officials

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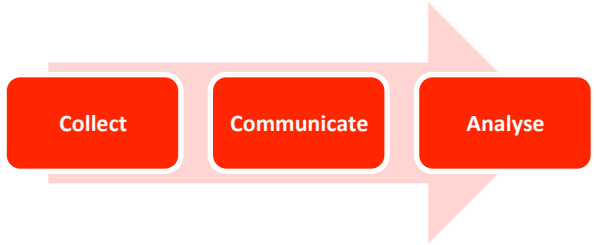
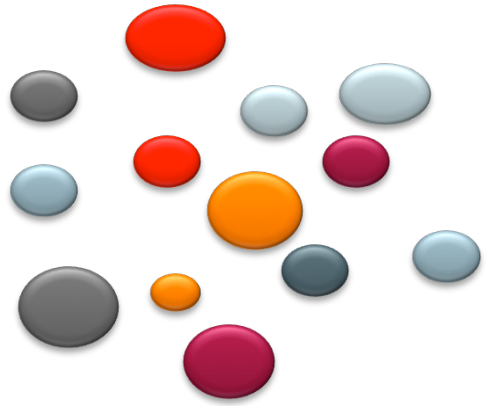
Follow a process





Why do something

What to do

How to do it

Enterprise Project Portfolio Management

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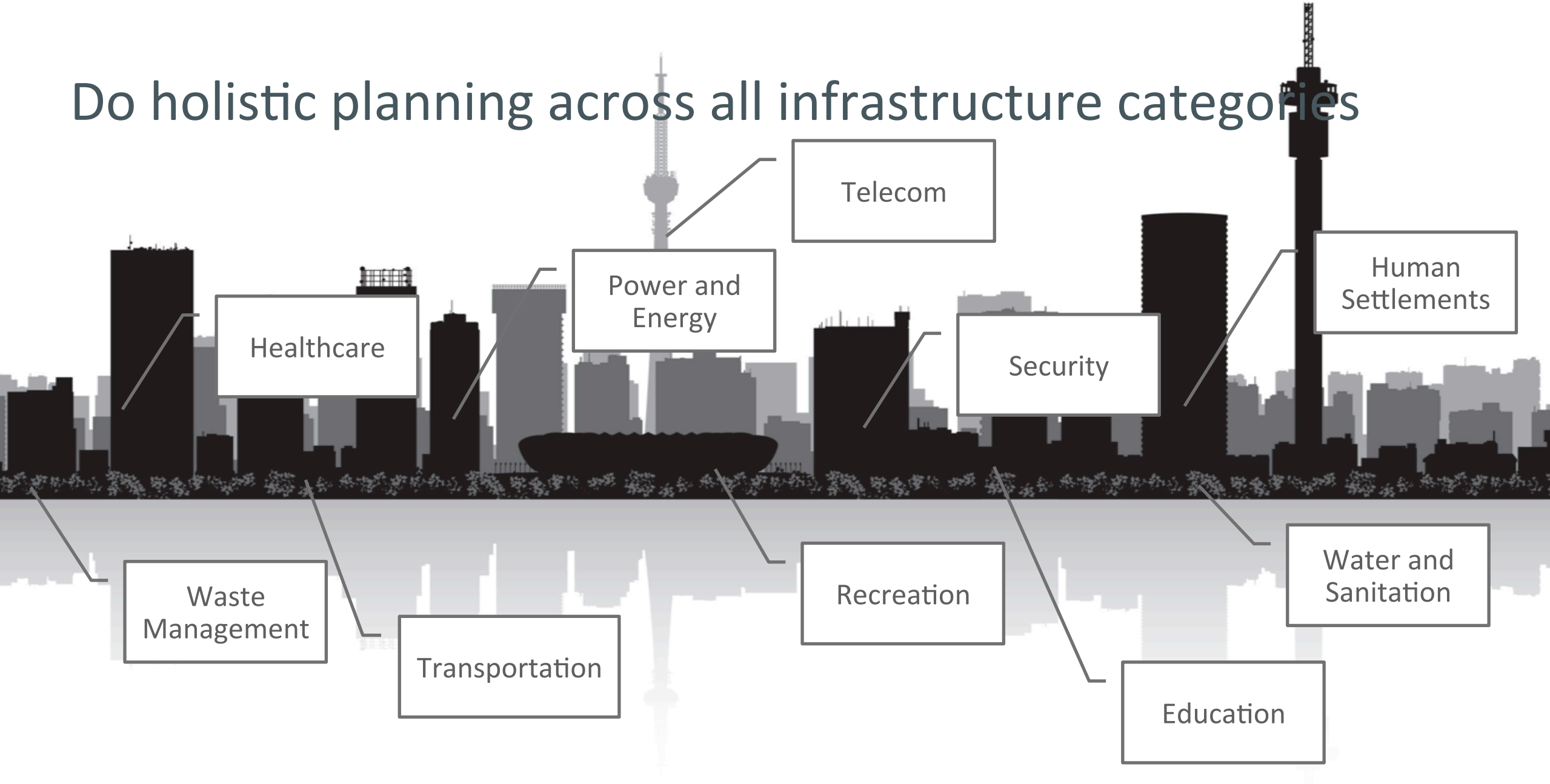
Do holistic planning across all infrastructure categories



Primavera Smart City Projects Solutions

Monitoring and Evaluation

Gain insight in project portfolio selection and performance

Plan

Selecting the right projects to enable the strategic plan

Build

Implementing projects with confidence and with predictable outcomes

Operate

Maintain the infrastructure and facilities for sustainable productivity

Built on the Oracle Primavera technology platform to provide a full enterprise project portfolio management solution for the airport industry

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Primavera Smart City Projects Solutions

Plan

- Align with the strategic plan
- Prepare capital plan
- Identify funding requirements
- Plan inter-dependent projects
- Select and qualify vendors

Build

- Facilitate team collaboration
- Coordinate delivery effort
- Ensure transaction auditability
- Enforce process governance
- Control contract change

Operate

- Transition to operations
- Maintain critical facilities
- Manage property portfolio

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Smart City Projects Solution Benefits

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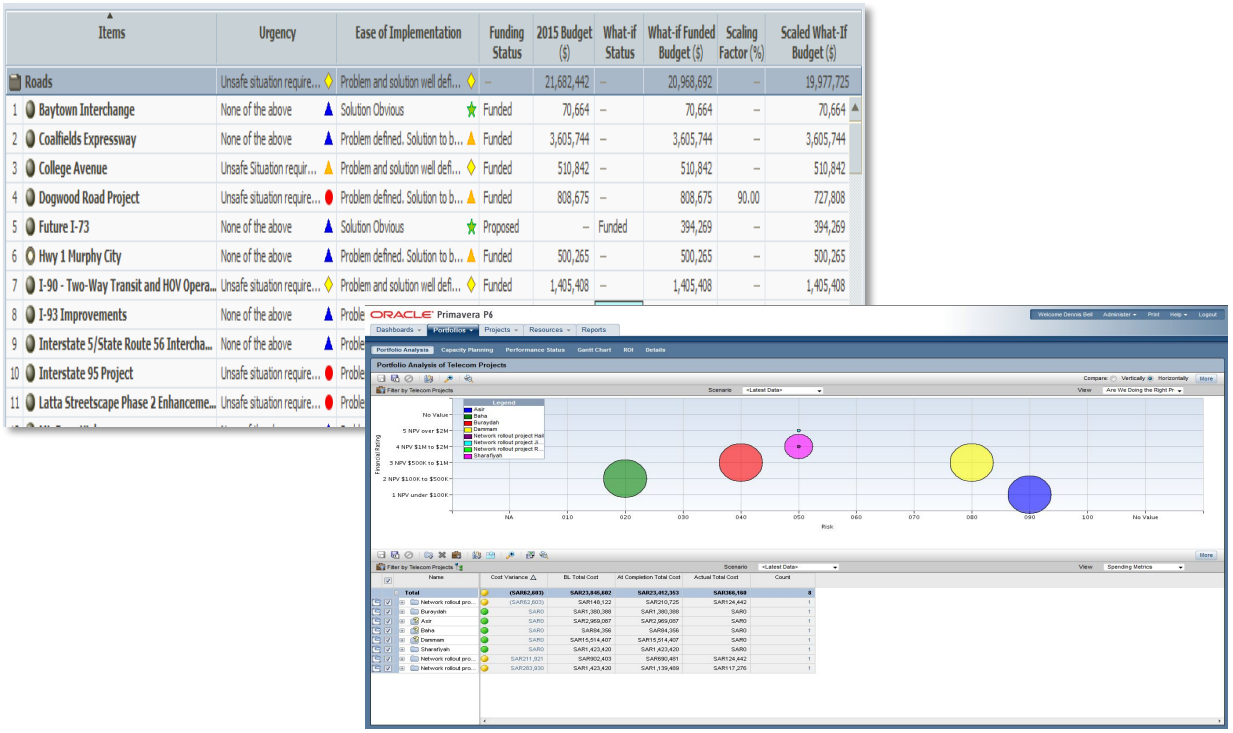
Track program alignment with development objectives



	Items	Urgency	Ease of Implementation	Funding Status	2015 Budget ($)	What-if Status	What-if Funded Budget ($)	Scaling Factor (%)	Scaled What-If Budget ($)
	Roads	Unsafe situation require...	Problem and solution well defi...	–	21,682,442	–	20,968,692	–	19,977,725
1	Baytown Interchange	None of the above	Solution Obvious	Funded	70,664	–	70,664	–	70,664
2	Coalfields Expressway	None of the above	Problem defined. Solution to b...	Funded	3,605,744	–	3,605,744	–	3,605,744
3	College Avenue	Unsafe Situation requir...	Problem and solution well defi...	Funded	510,842	–	510,842	–	510,842
4	Dogwood Road Project	Unsafe situation require...	Problem defined. Solution to b...	Funded	808,675	–	808,675	90.00	727,808
5	Future I-73	None of the above	Solution Obvious	Proposed	–	Funded	394,269	–	394,269
6	Hwy 1 Murphy City	None of the above	Problem defined. Solution to b...	Funded	500,265	–	500,265	–	500,265
7	I-90 - Two-Way Transit and HOV Opera...	Unsafe situation require...	Problem and solution well defi...	Funded	1,405,408	–	1,405,408	–	1,405,408
8	I-93 Improvements	None of the above	Proble						
9	Interstate 5/State Route 56 Intercha...	None of the above	Proble						
10	Interstate 95 Project	Unsafe situation require...	Proble						
11	Latta Streetscape Phase 2 Enhanceme...	Unsafe situation require...	Proble						

Select transformational projects which are aligned with the strategic objectives of the organization

Develop the long range capital plan to inform future infrastructure funding requirements

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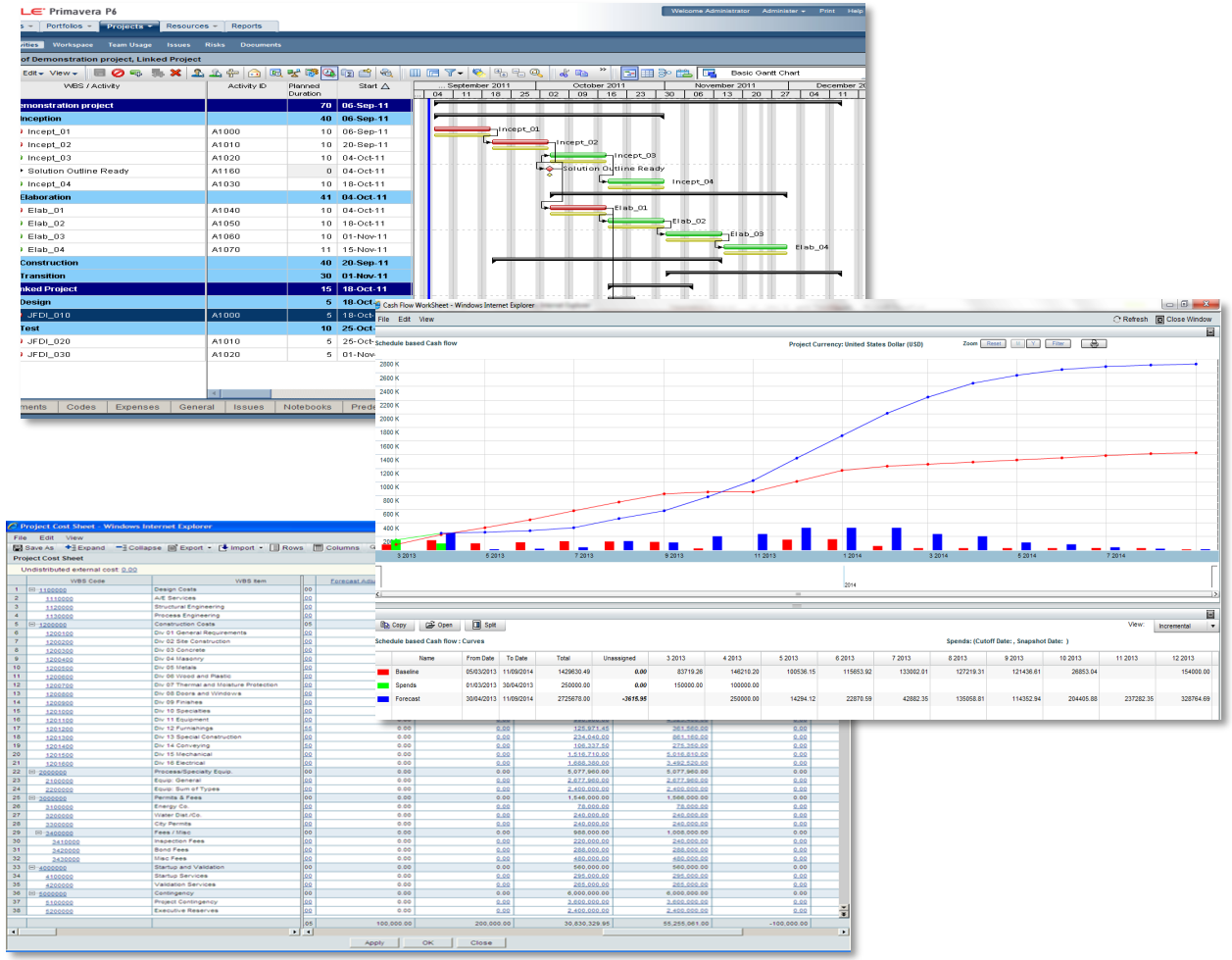
Set a standard for project set-up and close-out processes



Ensure best-practice project set-up principals are used across the organization

Streamline the asset hand-over process to operations at the end of the project by setting the criteria early

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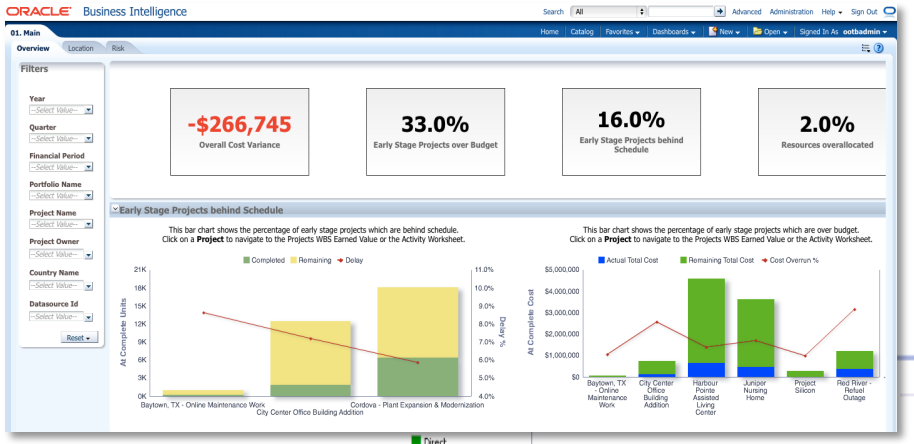
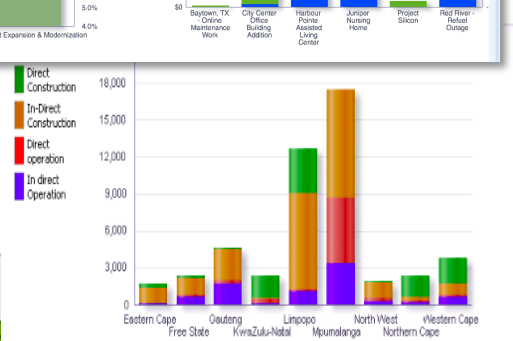
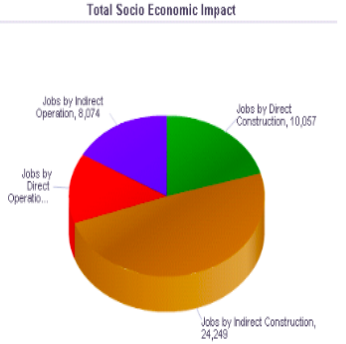
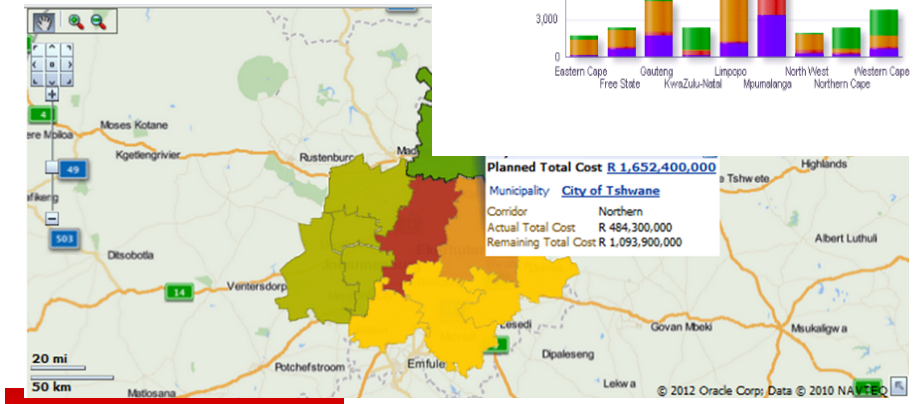
Facilitate standard performance monitoring and reporting









Privide accurate and timely information to support executive and management decisions on corrective action

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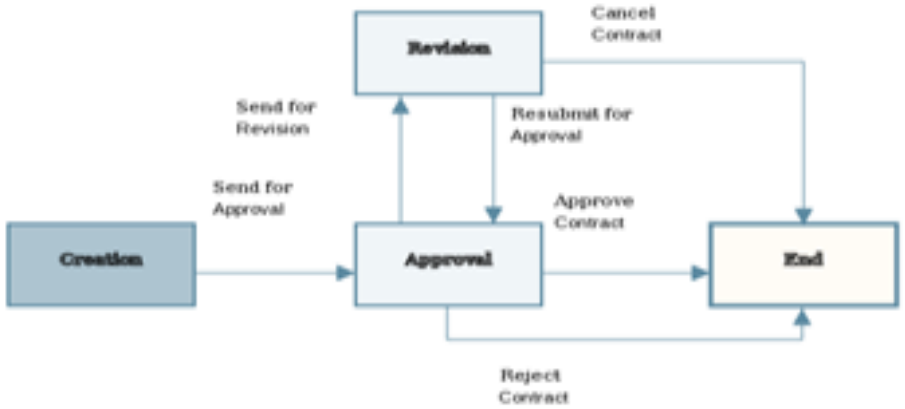
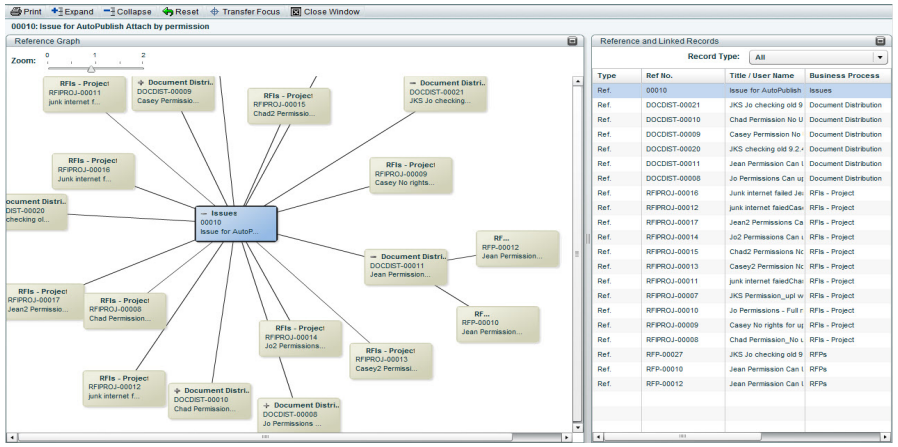
Enforce governance and auditability





Implement strong financial governance structures across all projects with role based workflow and transaction traceability

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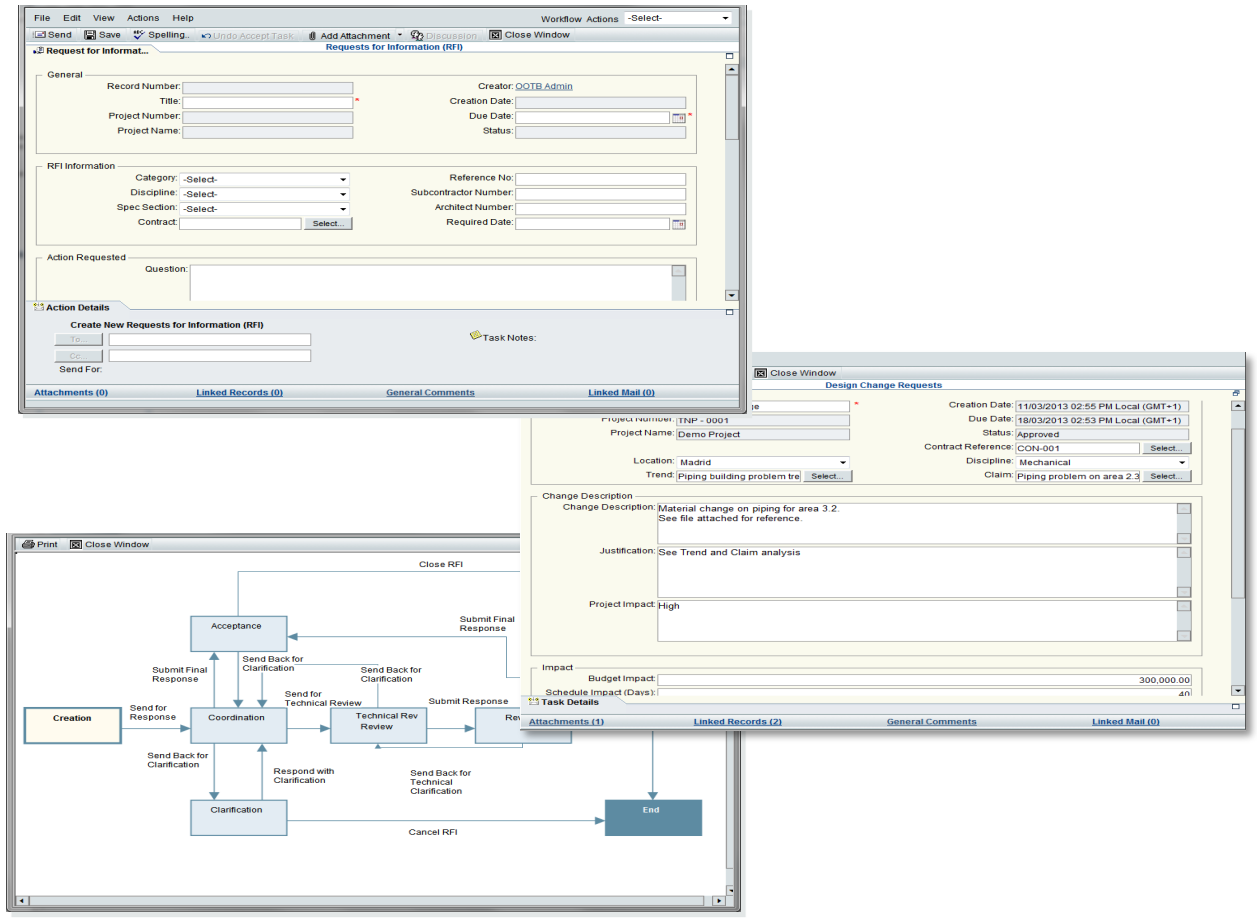
Formal scope and change management



Implement a formal scope and contract change management process to prevent uncontrolled cost growth

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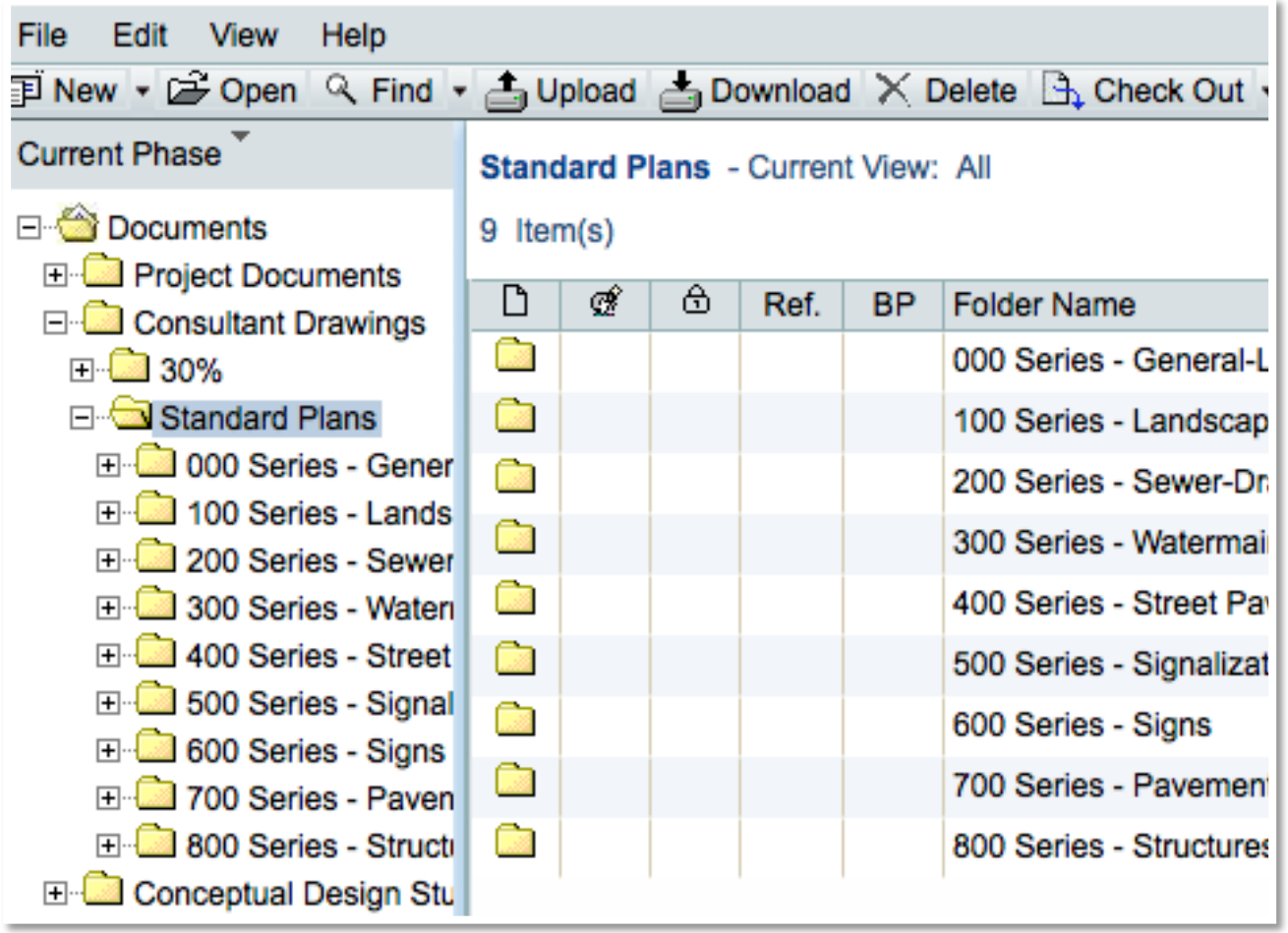
Electronic document control and hand-over



Implement a central document tracking and control process across all organizational divisions, Contractors and Suppliers to foster collaboration and traceability

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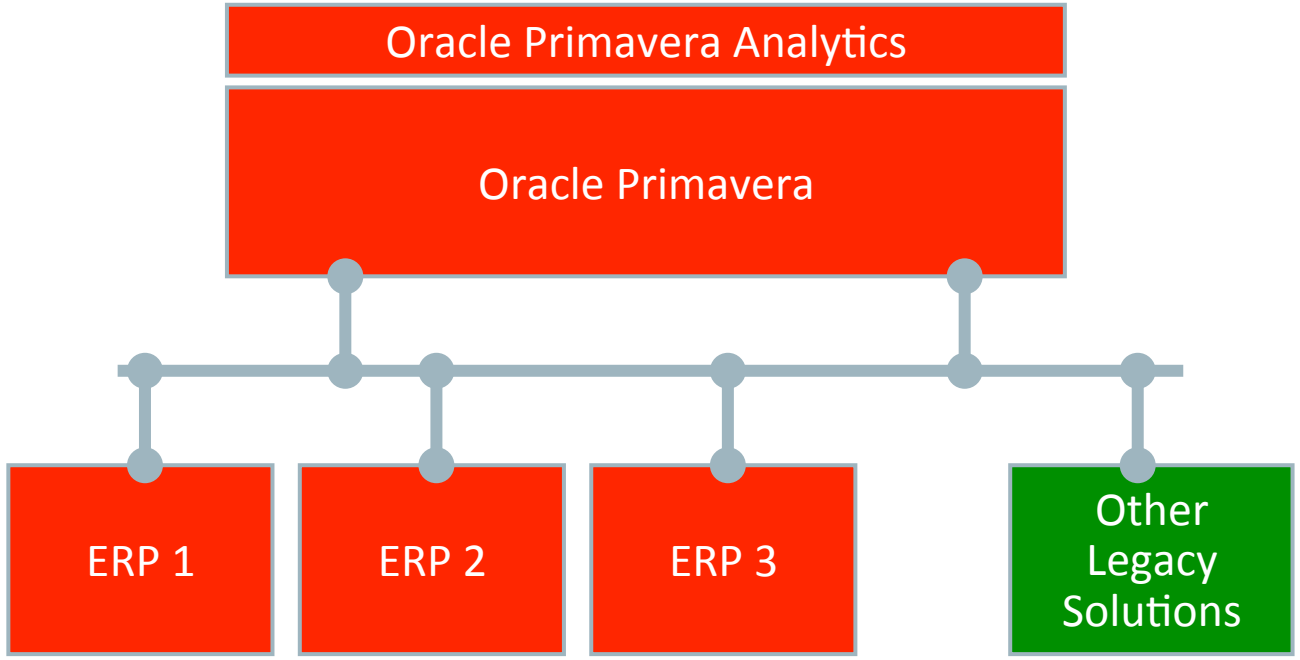
Automated interface with the transaction control system



Improve operational efficiencies by leveraging current investments in ICT solutions. Eliminate manual re-capture of data and ensure data integrity

Enabling the Project Driven Supply Chain

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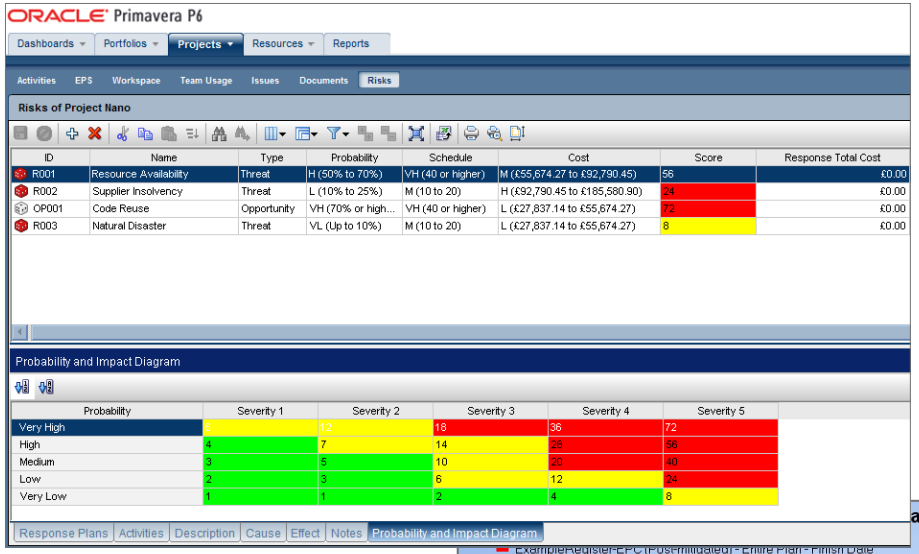
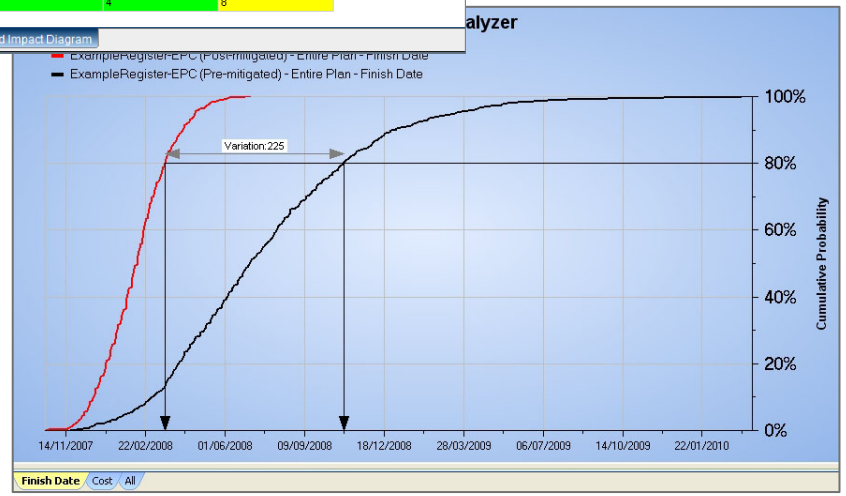
Formal program and project risk management





Leverage a formal risk and opportunity management process across all projects in the infrastructure portfolio. Take preventive and mitigation action at the portfolio level to benefit all projects.

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Collaboration between owners teams, EPCMs, main contractors and sub-contractors

Leverage technology to improve cross-organization collaboration on projects.

Enhance the mobility of the project team members across all stakeholder organizations.

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Standard contract management approach

Leverage standard contract forms like NEC3 to improve infrastructure delivery projects. Establish a single communication platform for all project stakeholders and ensure communication traceability to facilitate claims administration.

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Sample Customers

San Francisco International Airport

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How did a £2.3billion European airport project do it?

- Alignment of all contractors on business objectives
- Effective risk mitigation
- Early contractor involvement
- Integrated planning with all parties concerned
- Cross-team collaboration
- Tolerance for raising and resolving “Issues”
- Standard contract format
- Standard project delivery systems

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The SFO International Airport approach

- $4.1billion, 10yr capital improvement program
- The Exceptional Project Delivery process
  - Through it, owners, stakeholders, designers, sub-consultants and sub-contractors operate in a structured and integrated team
  - Use integrated technology systems to enhance collaboration
  - The standard for scheduling is Primavera P6
- Now implementing the balance of the Primavera modules

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Gauteng Department of Infrastructure Development

- Implementing agent for social infrastructure projects
  - Housing
  - Education
  - Healthcare
- Re-defined business processes to follow the National Treasury Methodology
- Deployed Oracle Primavera for project management and control
- Integrated with the ERP for transactional controls
- Gained early solution benefits through information consolidation

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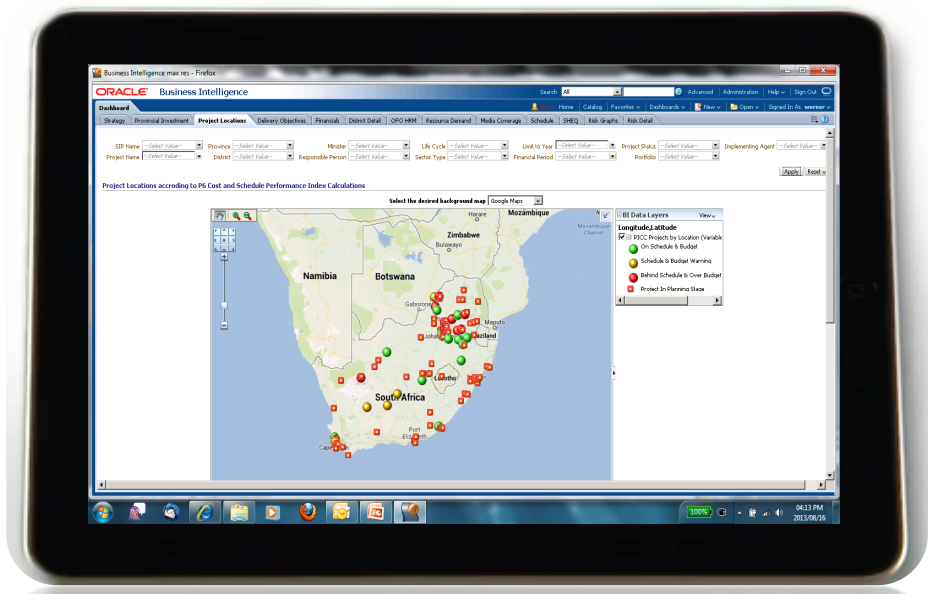
A use-case for Africa:



Questions from the PMO:

Answered with Enterprise Project Portfolio Management

Monitoring and Evaluation

Gain insight in project portfolio selection and performance

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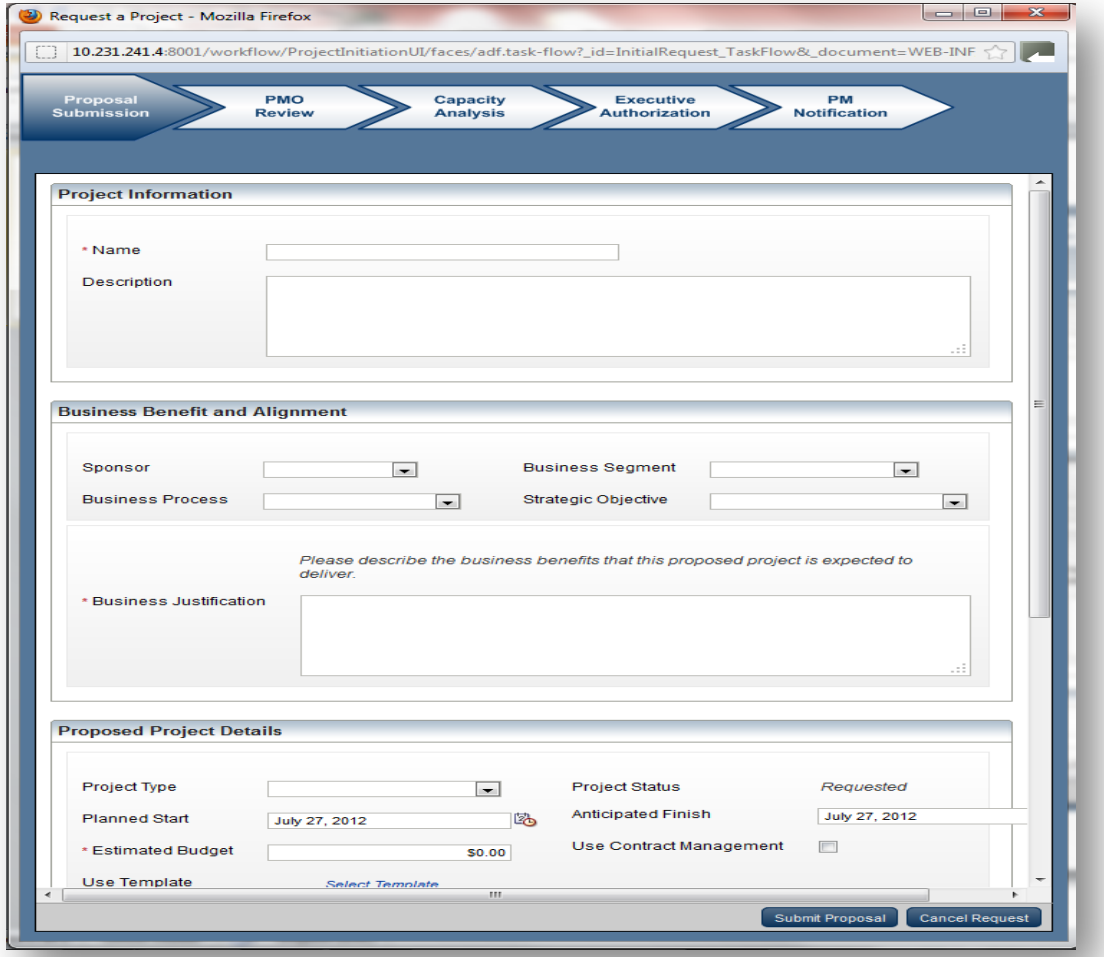
Q: How do I capture demand for new projects?



- New projects are proposed in the central enterprise project management solution
- Approval for the new project is done via an approval workflow

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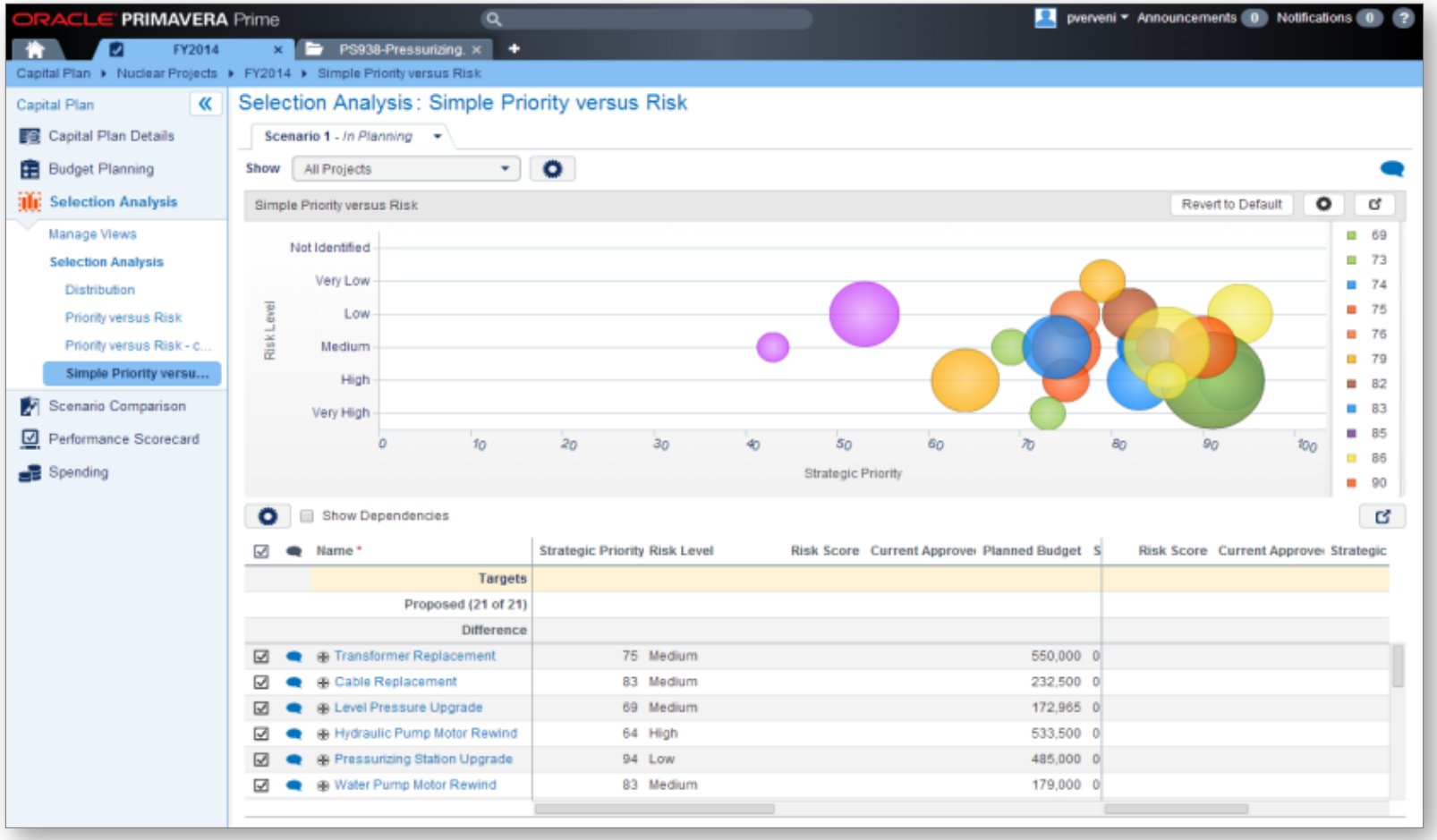
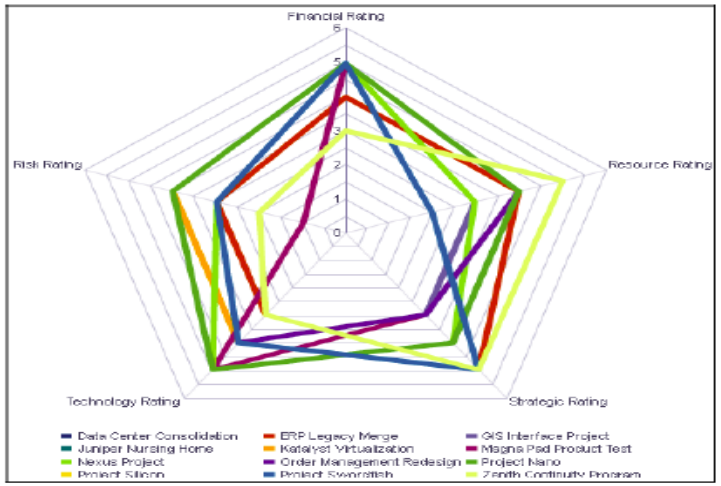
Q: Are our projects aligned with the strategic objectives?





Strategic Objective	Project Name	Funding Source	Funding Value (R)
Accelerated Social Transformation	Construction of Carltonville Waste Management Depot	UnFund	R 40,000,000
	Construction of New Soshanguve Clinic	Municipal Infrastructure Grant	R 75,000,000
	Construction of a new 88kV (30 Circuits) Yard	Regional Bulk Infrastructure Grant	R 15,000,000
	Construction of the Lakeside Library	External Funding	R 65,000,000
	Khutsong Roads and Stormwater	External Funding	R 86,200,000
	Nancefield Station Precinct Development	Development Bank of South Africa	R 74,000,000
	Olifantsvlei Cemetry Renewal	Internal Funding	R 51,000,000
	Rehabilitation of Khutsong Water services	Regional Bulk Infrastructure Grant	R 43,000,000
	Rehabilitation of Sports Stadium in Springs	Provincial Funding	R 33,200,000
	Sharpville ECD and Aged Day Care	Municipal Funding	R 66,200,000
	Simunye Internal Roads	External Funding	R 86,200,000
Decisive Spatial Transformation	Acquisition of Land for New Human Settlements	Municipal Infrastructure Grant	R 195,000,000
	Braamfischerville Ext 12 & 13 - Roads and Stormwater	Development Bank of South Africa	R 16,000,000
	Construction of a Zonkisizwe Multi-Purpose Center	Other Funding	R 70,000,000
	Diepsloot East New Infrastructure	UnFund	R 45,200,000
	Land Acquisition Project	Municipal Infrastructure Grant	R 4,500,000
	PR16 Singobile Phase 3 Roads and Stormwater	External Funding	R 86,200,000
	Project Linked Housing - Water Provision	UnFund	R 43,000,000
	Simunye PMS & RCC (Gymnasium)	UnFund	R 24,610,000
	Upgrading of Transmission Line Between Factoria & Libertas	Regional Bulk Infrastructure Grant	R 36,000,000
Modernisation of Human Settlements & Urban Development	Evaton Renewal Programme	Regional Bulk Infrastructure Grant	R 75,000,000
	Extension of Daleside Sewer	External Funding	R 43,000,000
	Flooding Backlogs - Networks and Drainage Canals	Development Bank of South Africa	R 460,000,000
	High Mast Lights De Deur	Municipal Funding	R 36,000,000
	Khutsong Multi-Purpose Community Center	Provincial Funding	R 26,500,000

Rows 1 - 25

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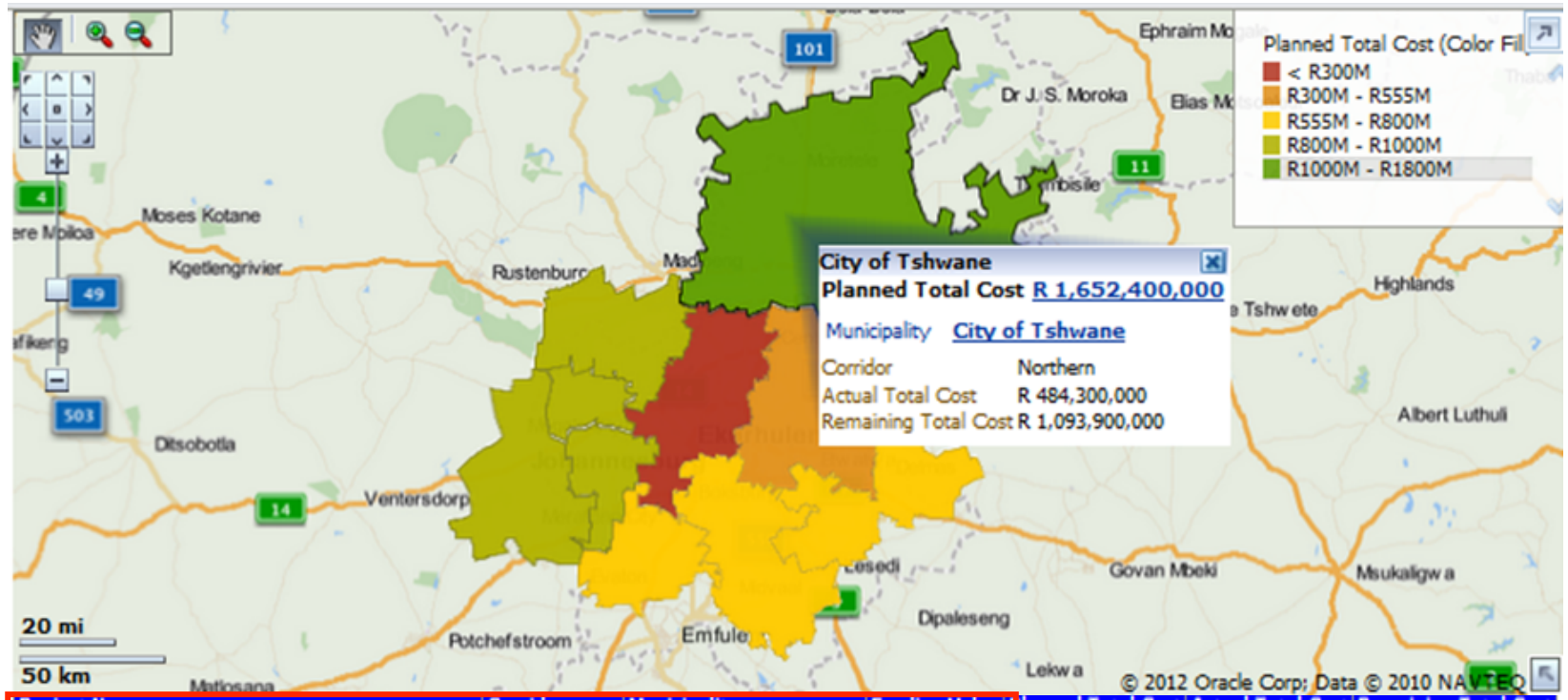
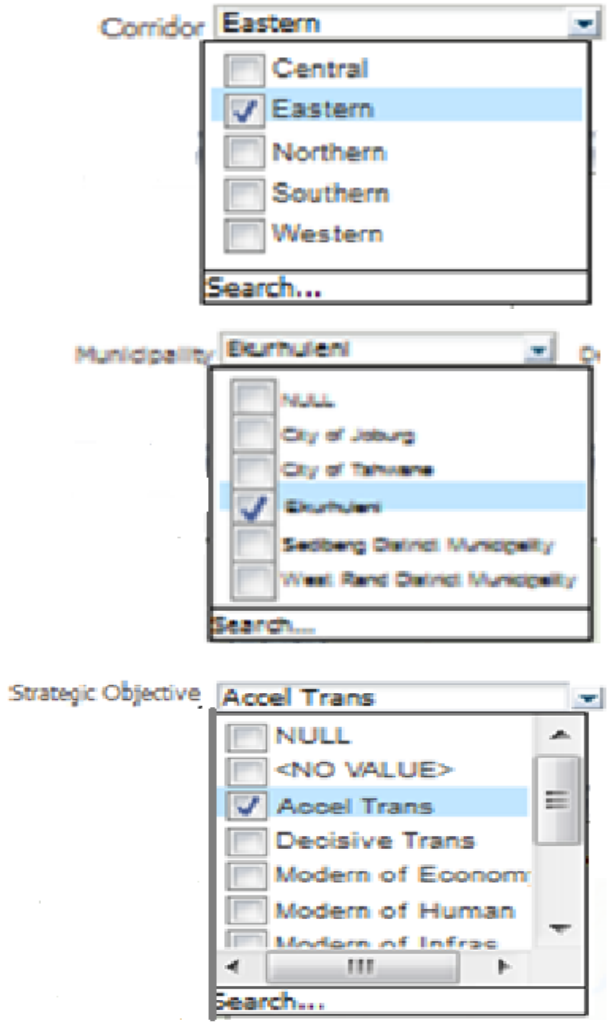
Q: What is the geographical distribution of our investment?



Project Name	Corridor	Municipality	Funding Value	Planned Total Cost	Actual Total Cost	Remaining Total Cost
Braamfischerville Ext 12 & 13 - Roads and Stormwater	Central	City of Joburg	R 16,000,000	R 16,000,000	R 12,000,000	R 4,000,000
Construction of Transfer Stations in Westonaria	Western	West Rand District Municipality	R 15,000,000	R 15,000,000	R 10,000,000	R 5,000,000
Construction of a Zonkisizwe Multi-Purpose Center	Eastern	Ekurhuleni	R 70,000,000	R 74,000,000	R 30,000,000	R 44,000,000
Evaton Renewal Programme	Southern	Sedibeng District Municipality	R 75,000,000	R 75,000,000	R 65,000,000	R 10,000,000
Khutsong South Extensions Electrification Phase 3	Western	West Rand District Municipality	R 36,000,000	R 36,000,000	R 22,000,000	R 14,000,000



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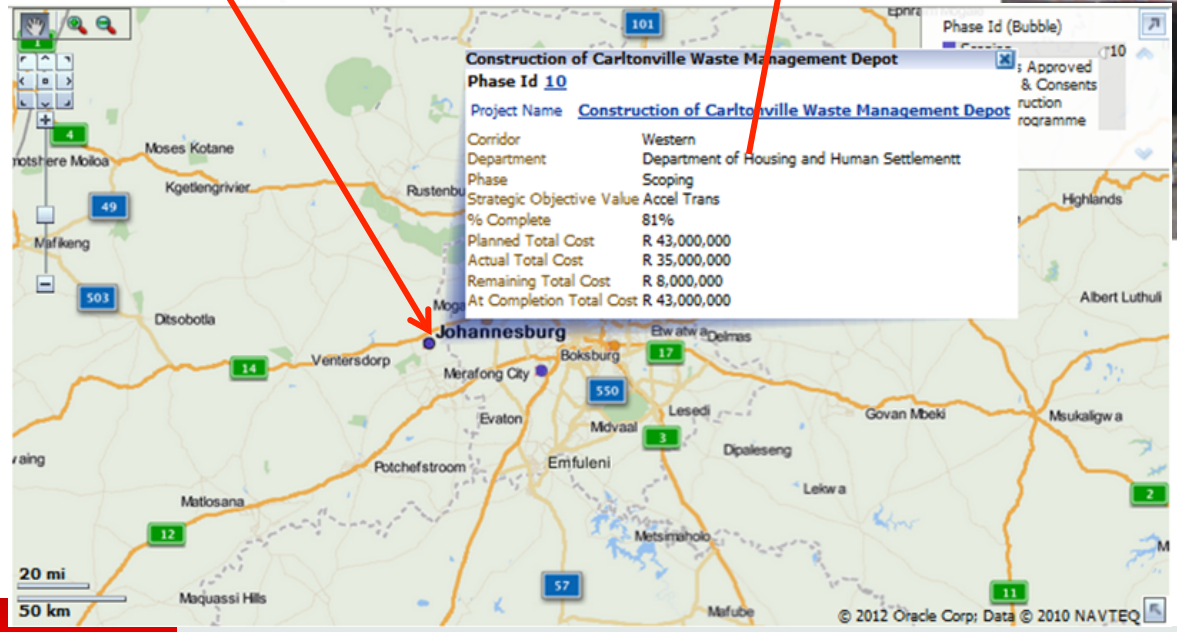
Q: Where are the projects we are spending money on?

Project Detail

Department	Department of Housing and Human Settlementt
Project Name	Construction of Carltonville Waste Management Depot
Corridor	Western
Municipality	West Rand District Municipality
Status	Scoping
Planned Total Cost	R 43,000,000.00
Actual Total Cost	R 35,000,000.00
Remaining Total Cost	R 8,000,000.00
At Completion Total Cost	R 43,000,000.00
Further Info	Project Workspace



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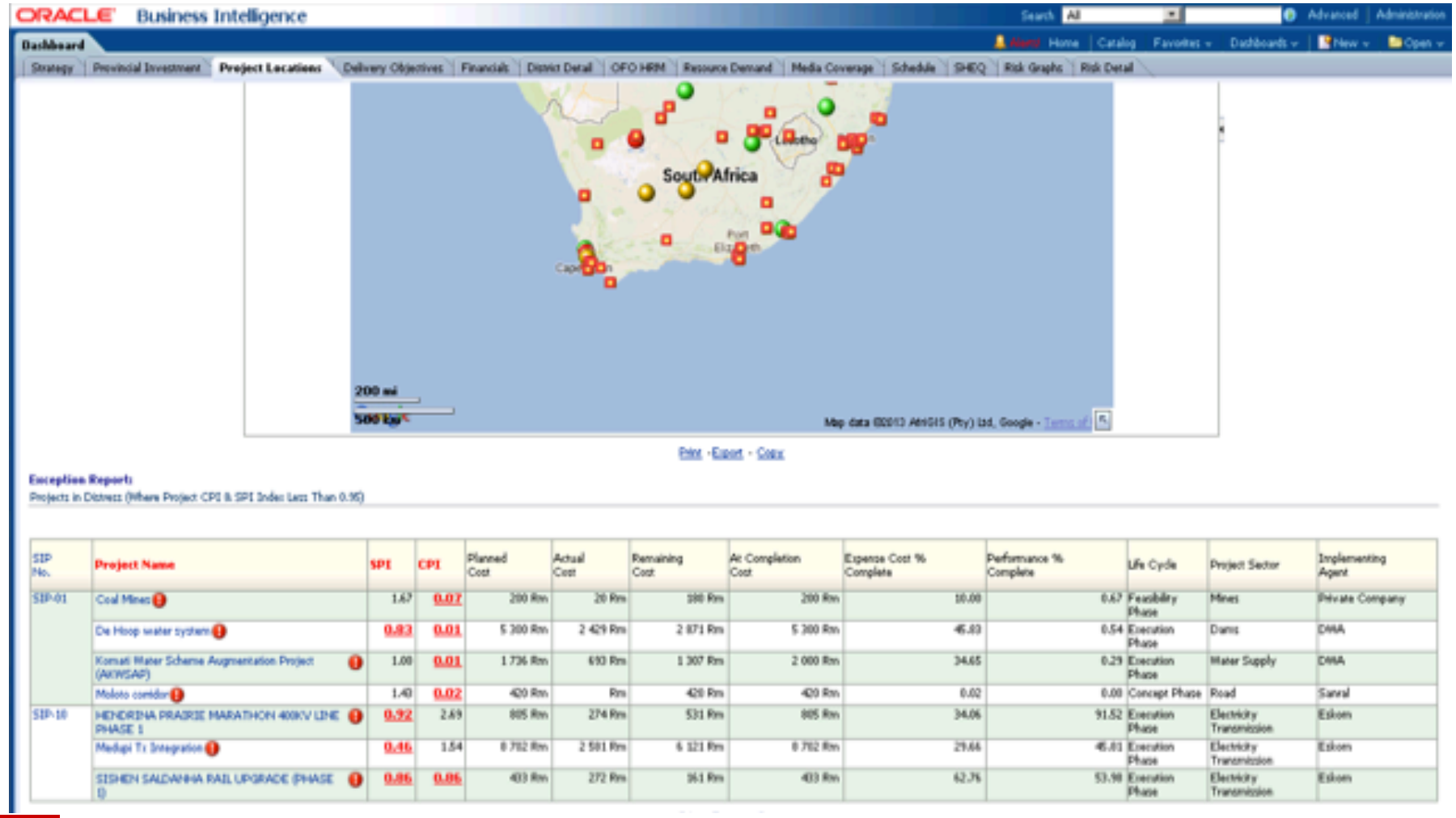
Q: How are these projects performing?



SIP No.	Project Name	SPI	CPI	Planned Cost	Actual Cost	Remaining Cost	At Completion Cost	Expense Cost % Complete	Performance % Complete	Life Cycle	Project Sector	Implementing Agent
SIP-01	Coal Mines	1.67	0.07	200 Rm	20 Rm	180 Rm	200 Rm	10.00	0.67	Feasibility Phase	Mines	Private Company
	De Hoop water system	0.83	0.01	5 200 Rm	2 429 Rm	2 871 Rm	5 300 Rm	46.03	0.54	Execution Phase	Dams	DWA
	Komati Water Scheme Augmentation Project (AKWSAP)	1.00	0.01	1 736 Rm	693 Rm	1 307 Rm	2 000 Rm	34.65	0.29	Execution Phase	Water Supply	DWA
	Moloto corridor	1.40	0.02	420 Rm	Rm	420 Rm	420 Rm	0.02	0.00	Concept Phase	Road	Sanral
SIP-10	HENDRINA PRAIRIE MARATHON 400KV LINE PHASE 1	0.92	2.69	805 Rm	274 Rm	531 Rm	805 Rm	34.06	91.52	Execution Phase	Electricity Transmission	Eskom
	Medupi T1 Integration	0.46	1.54	8 702 Rm	2 581 Rm	6 121 Rm	8 702 Rm	29.66	46.01	Execution Phase	Electricity Transmission	Eskom
	SISHEN SALDANHA RAIL UPGRADE (PHASE 1)	0.86	0.06	433 Rm	272 Rm	161 Rm	433 Rm	62.76	53.98	Execution Phase	Electricity Transmission	Eskom

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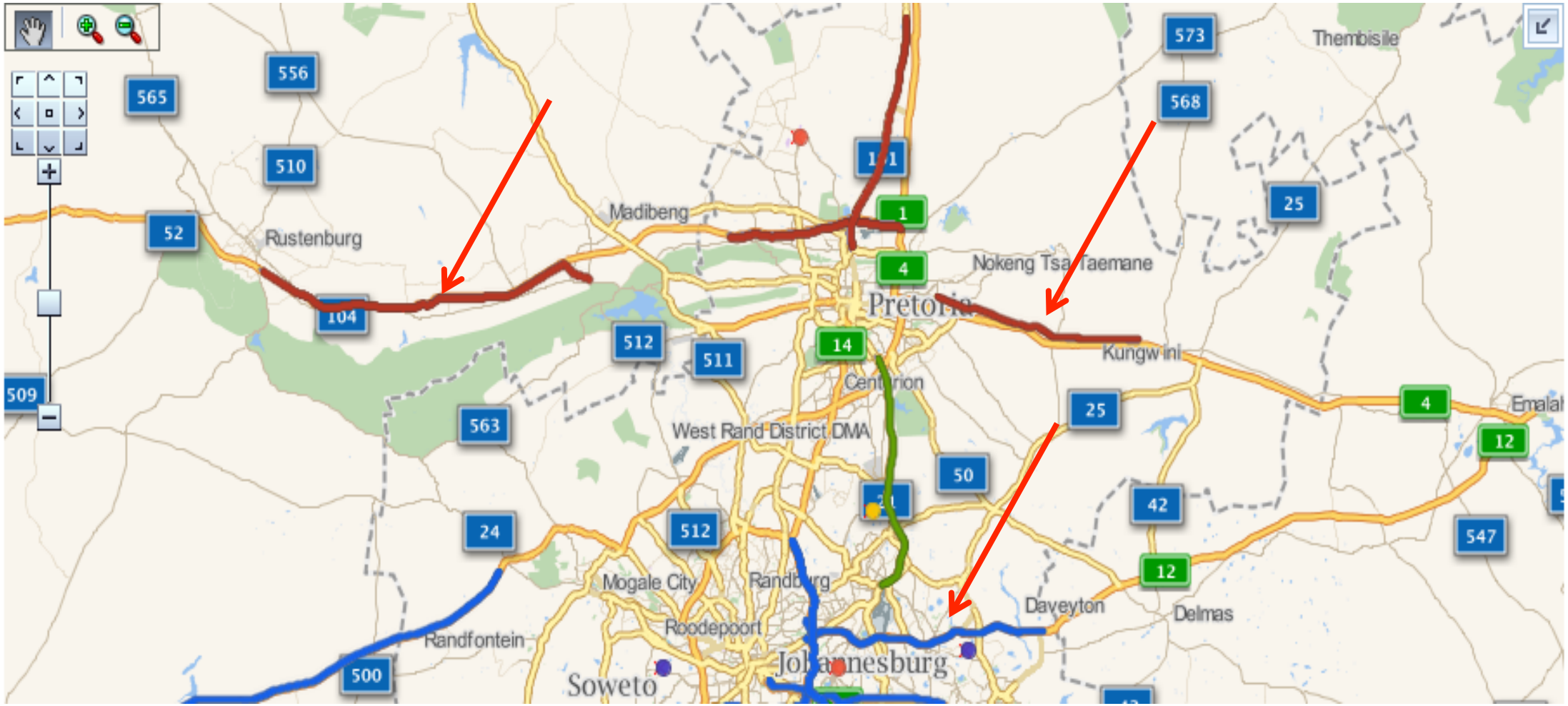
Q: What is the performance on road and rail projects?



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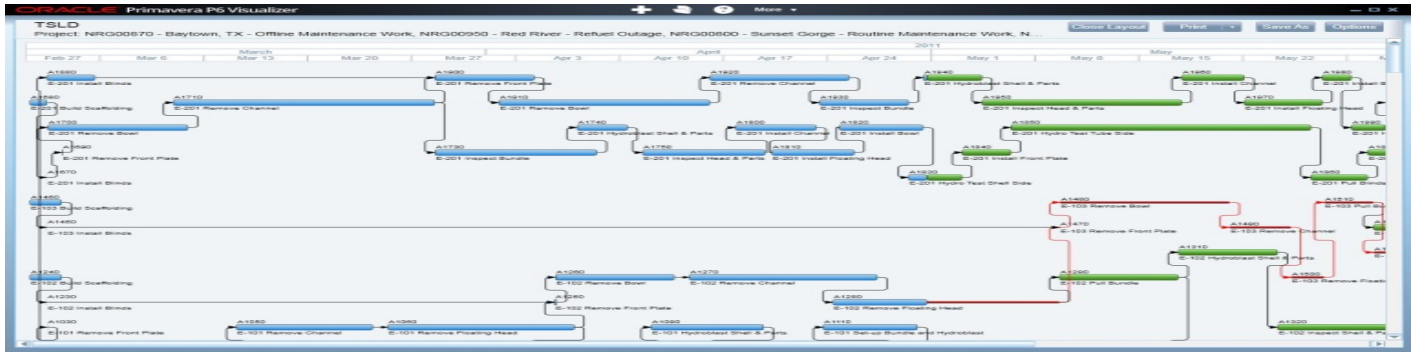
Q: Are the projects performing to schedule?

Region Central

Department	Project Name	Phase	% Complete	Planned Total Cost	Actual Total Cost	Remaining Total Cost	At Completion Total Cost
Department of Energy	Construction of a new 88kV (30 Circuits) Yard	Scoping	67%	R 15,000,000	R 10,000,000	R 5,000,000	R 15,000,000
Department of Housing and Human Settlementt	Braamfischerville Ext 12 & 13 - Roads and Stormwater	Consents Approved	75%	R 16,000,000	R 12,000,000	R 4,000,000	R 16,000,000
	Diepsloot East New Infrastructure	Planning & Consents	66%	R 45,200,000	R 35,000,000	R 18,000,000	R 53,000,000
Department of Roads and Transport	Cycling Routes - University of Joburg to Wits University	Scoping	29%	R 86,200,000	R 24,000,000	R 60,000,000	R 84,000,000
Department of Social Develpoment	Nancefield Station Precinct Development	Scoping	41%	R 74,000,000	R 30,000,000	R 44,000,000	R 74,000,000
	Olifantsvlei Cemetry Renewal	Scoping	24%	R 51,000,000	R 12,000,000	R 39,000,000	R 51,000,000



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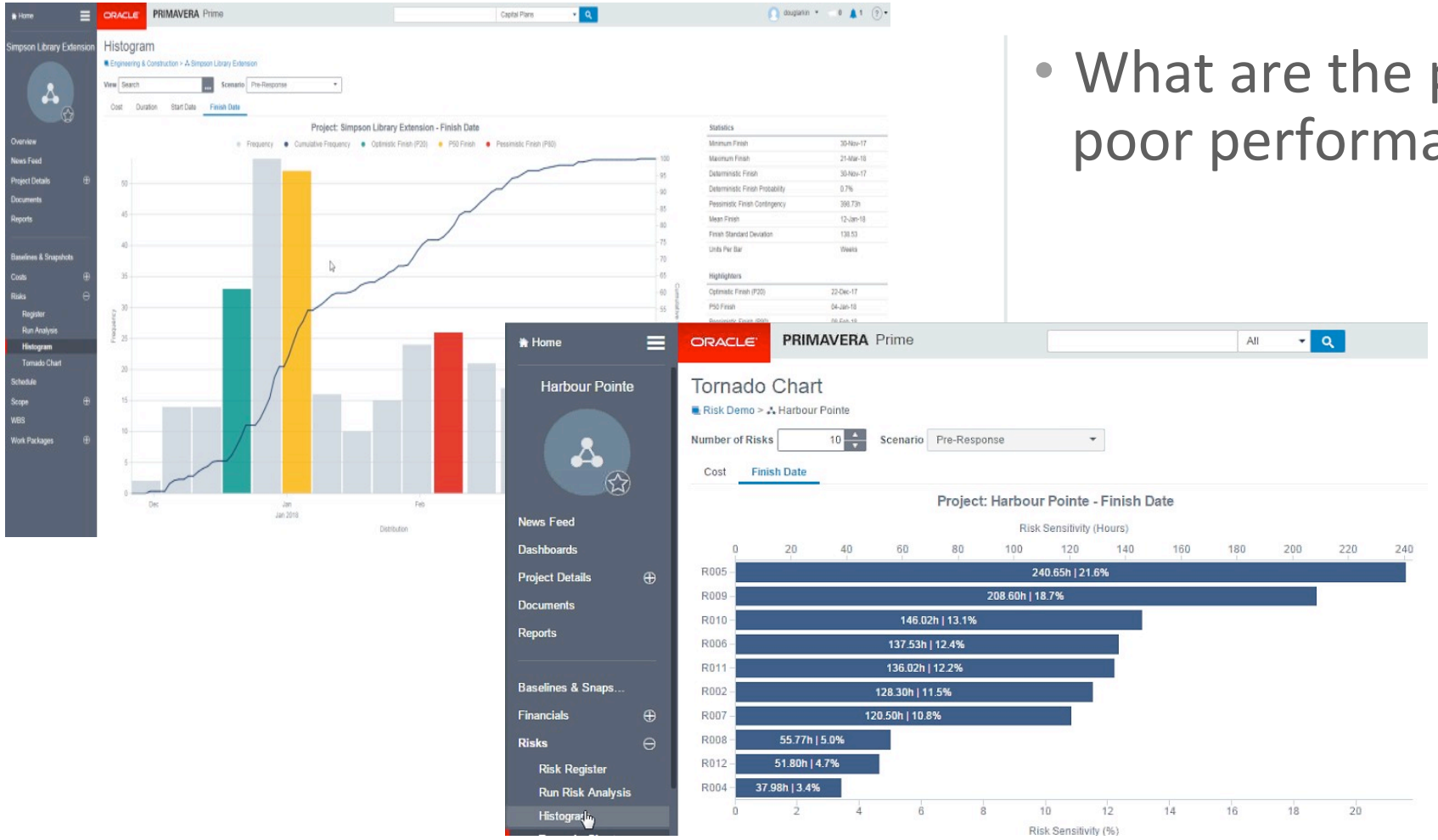
Q: How can we improve the project performance?



- What are the potential causes of poor performance?

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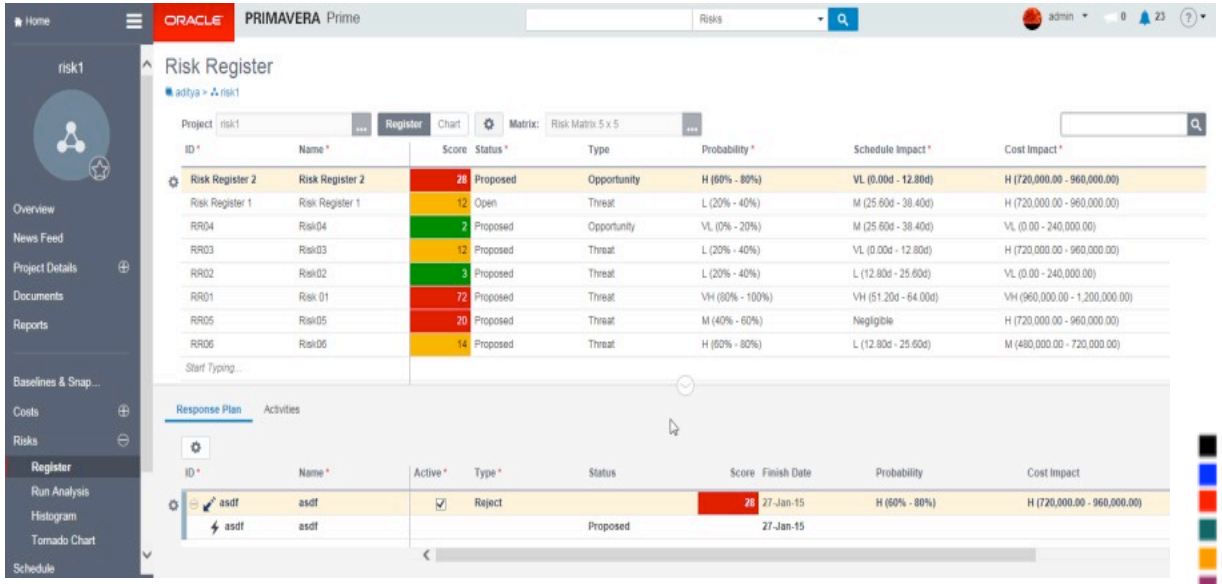
Q: What risks do we face on our projects?



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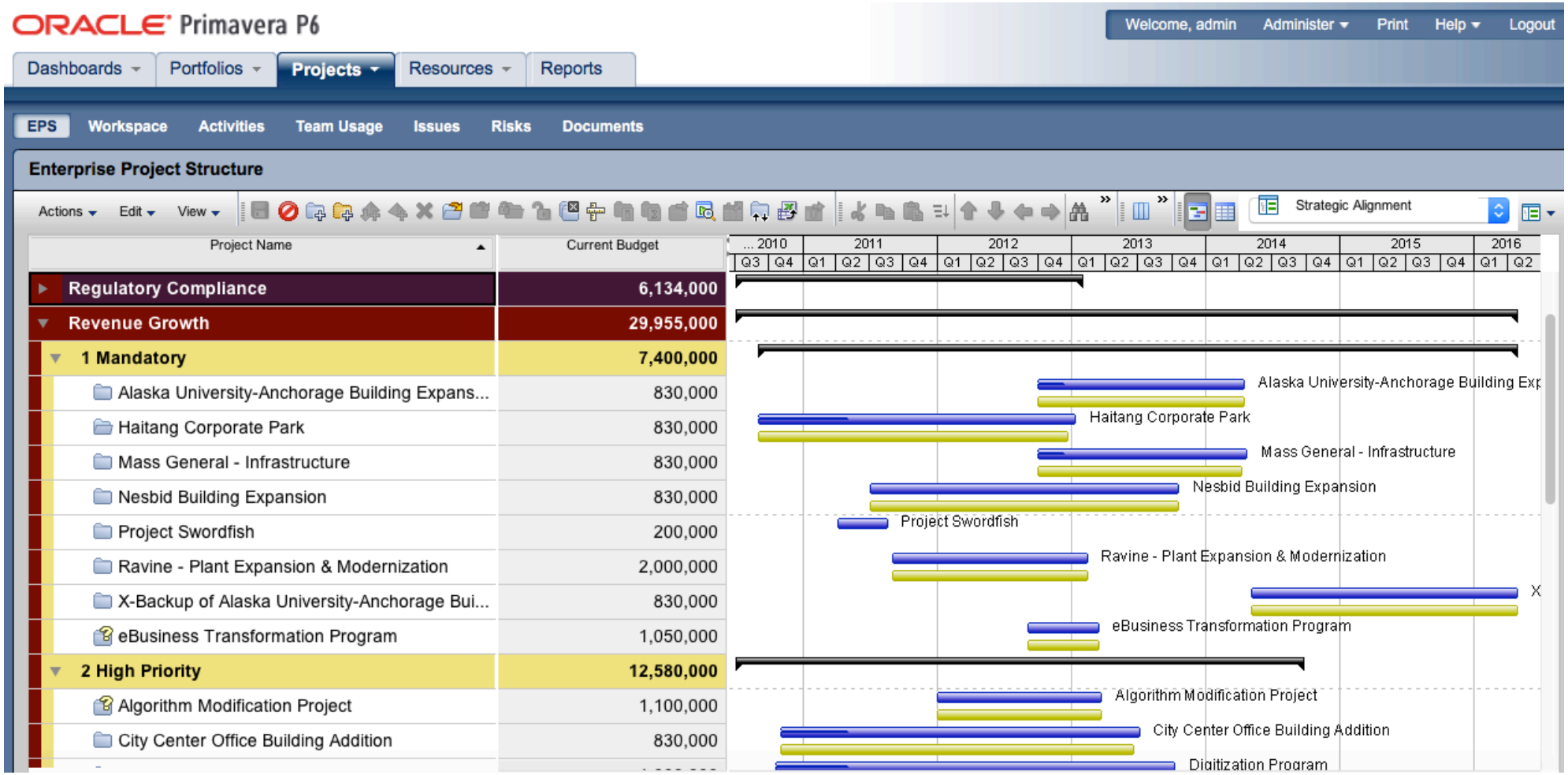
Q: How are the projects sequenced by priority?



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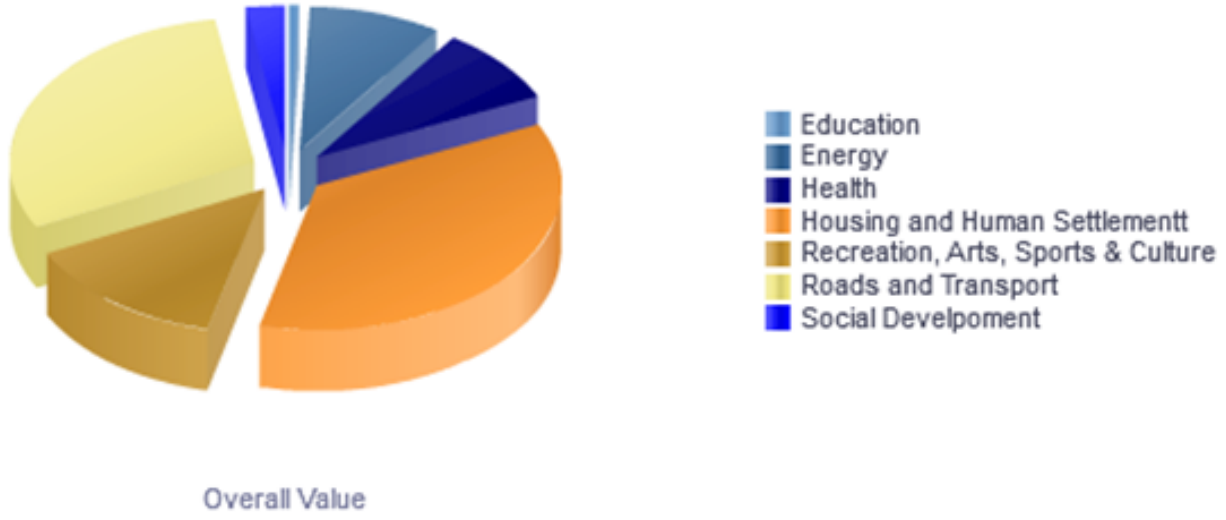
Q: On which categories are we spending our money?

Sector	Projects	Overall Value
Department of Education	1	R22 M
Department of Energy	4	R299 M
Department of Health	1	R290 M
Department of Housing and Human Settlementt	7	R1,212 M
Department of Recreation, Arts, Sports & Culture	4	R467 M
Department of Roads and Transport	6	R1,013 M
Department of Social Develpoment	2	R87 M
Total	**25**	**R3,391 M**



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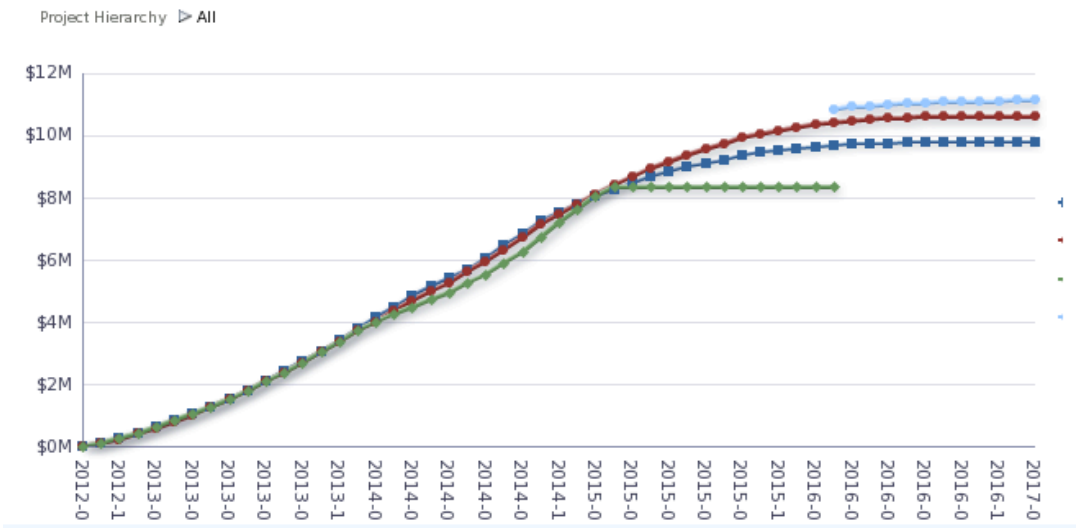
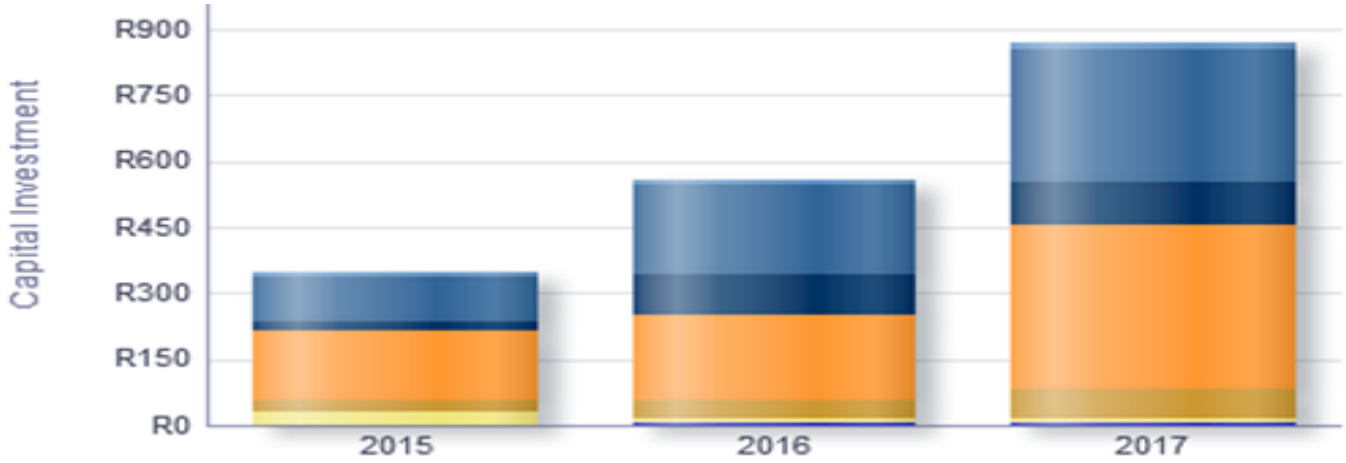
Q: What is our medium term expenditure outlook?

Annual Spend to 2015-17

Sector	2015	2016	2017
Department of Education	R2 M	R3 M	R3 M
Department of Energy	R28 M	R14 M	R12 M
Department of Health	R27 M	R38 M	R65 M
Department of Housing and Human Settlementt	R157 M	R193 M	R372 M
Department of Recreation, Arts, Sports & Culture	R20 M	R93 M	R103 M
Department of Roads and Transport	R102 M	R208 M	R300 M
Department of Social Develpoment	R13 M	R7 M	R14 M
Total	**R349 M**	**R557 M**	**R868 M**





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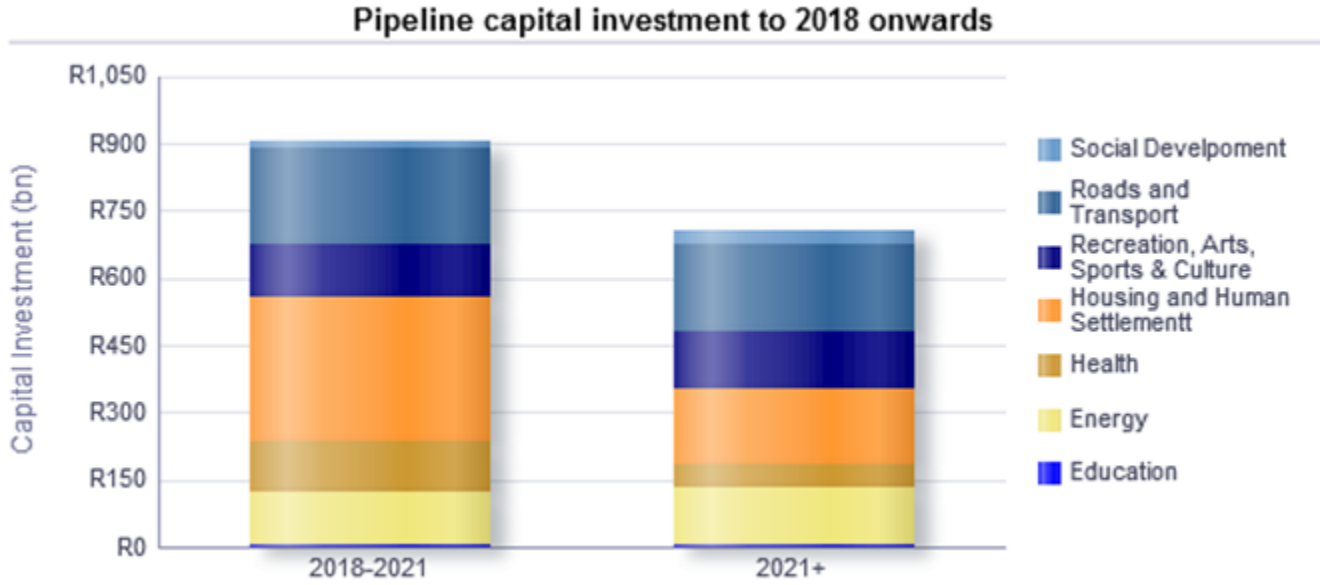
Q: What is our longer term expenditure outlook?

Forward Spend to 2018 onwards

Sector	2018-2021	2021+
Department of Education	R6 M	R8 M
Department of Energy	R119 M	R126 M
Department of Health	R111 M	R49 M
Department of Housing and Human Settlementt	R321 M	R170 M
Department of Recreation, Arts, Sports & Culture	R121 M	R129 M
Department of Roads and Transport	R213 M	R190 M
Department of Social Develpoment	R17 M	R36 M
Total	**R908 M**	**R709 M**



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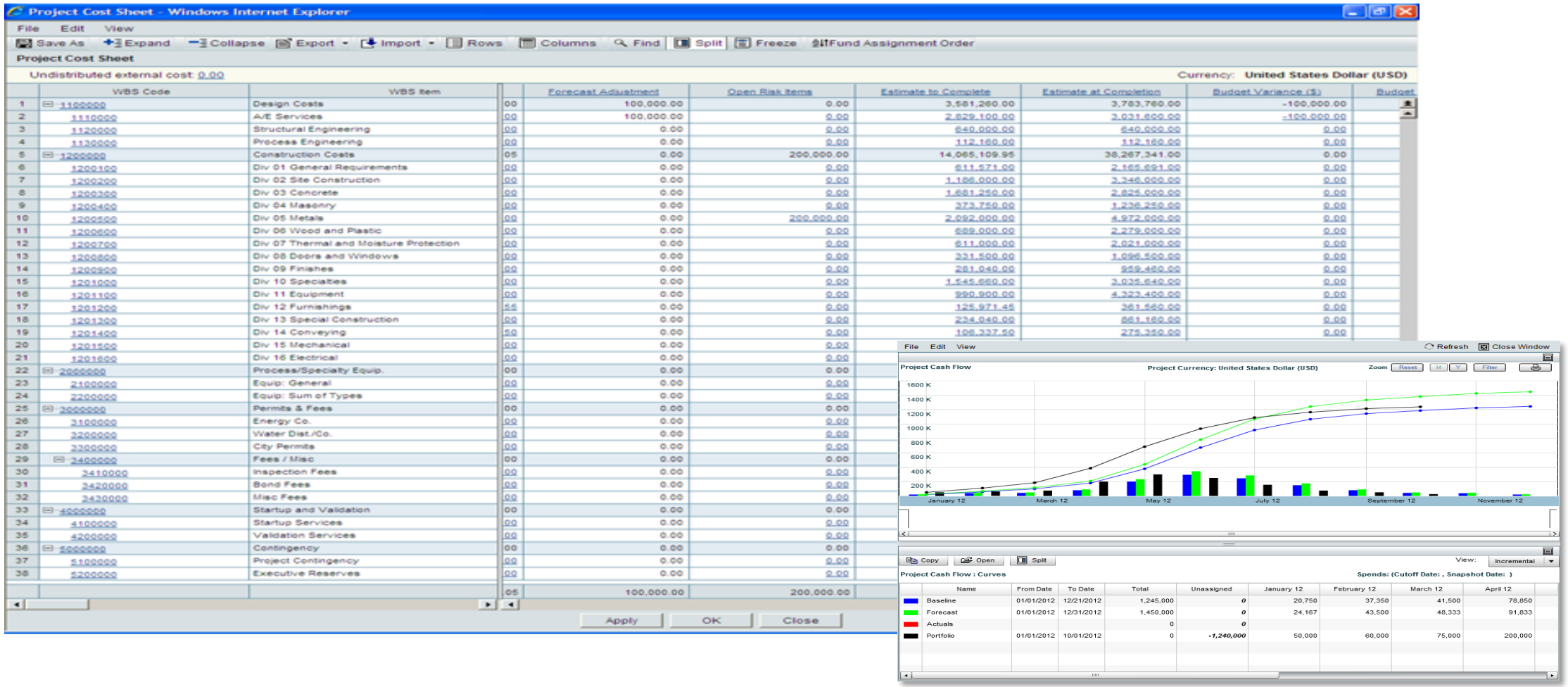
Q: Do we have financial insight and control?



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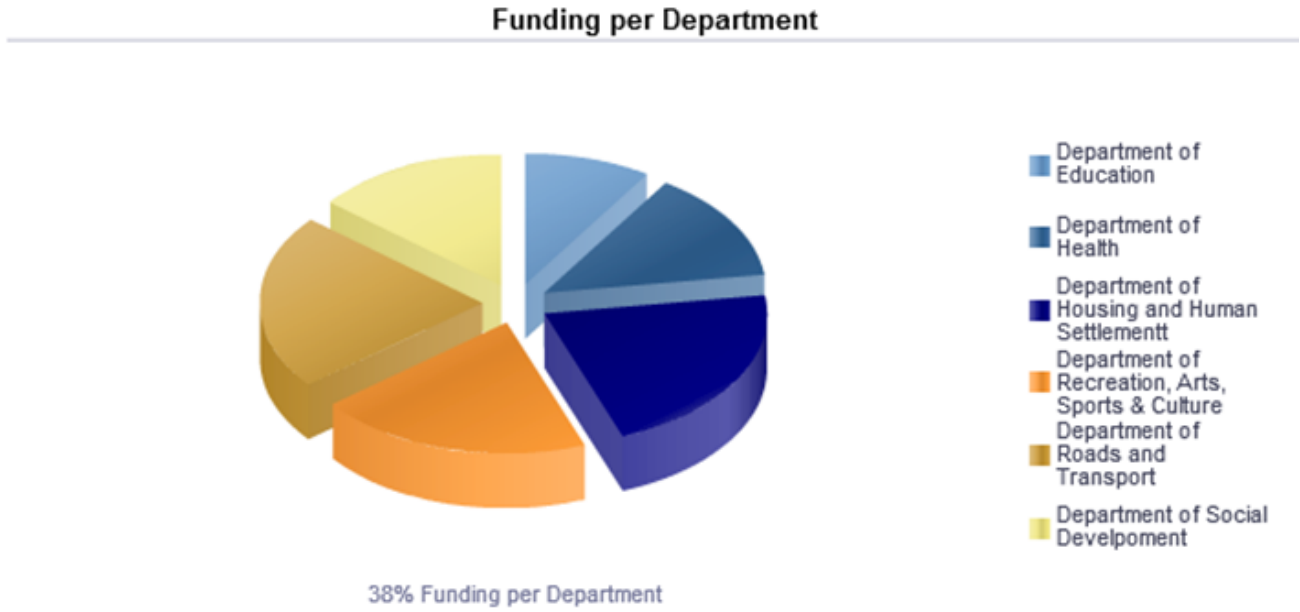
Q: How are we allocating our funding sources?

Funding Source	Funding per Source	% per Source
Development Bank of South Africa	1,485,000,000	38%
External Funding	452,800,000	12%
Internal Funding	63,200,200	2%
Municipal Funding	105,800,000	3%
Municipal Infrastructure Grant	708,200,000	18%
Other Funding	70,000,000	2%
Provincial Funding	188,900,000	5%
Regional Bulk Infrastructure Grant	607,200,000	16%
UnFund	222,810,000	6%
Grand Total	**3,903,910,200**	**100%**

Funding Source Description: Development Bank of South Africa



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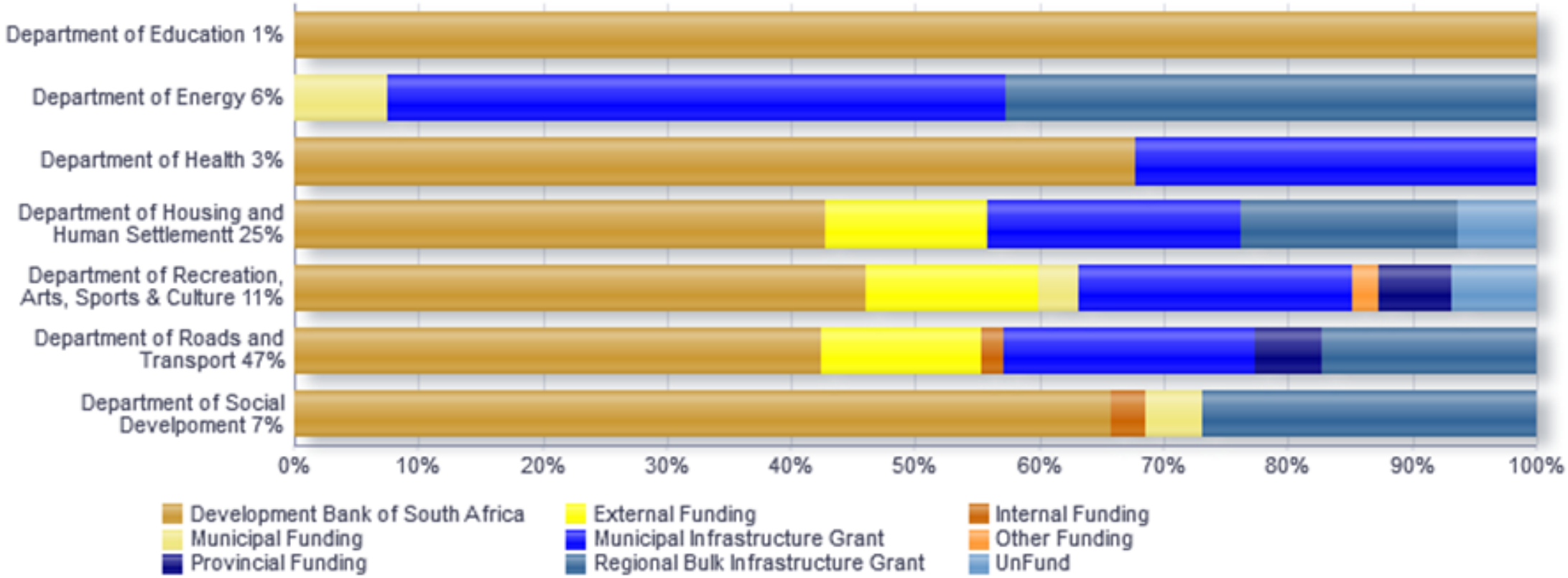
Q: What is the funding composition by department?



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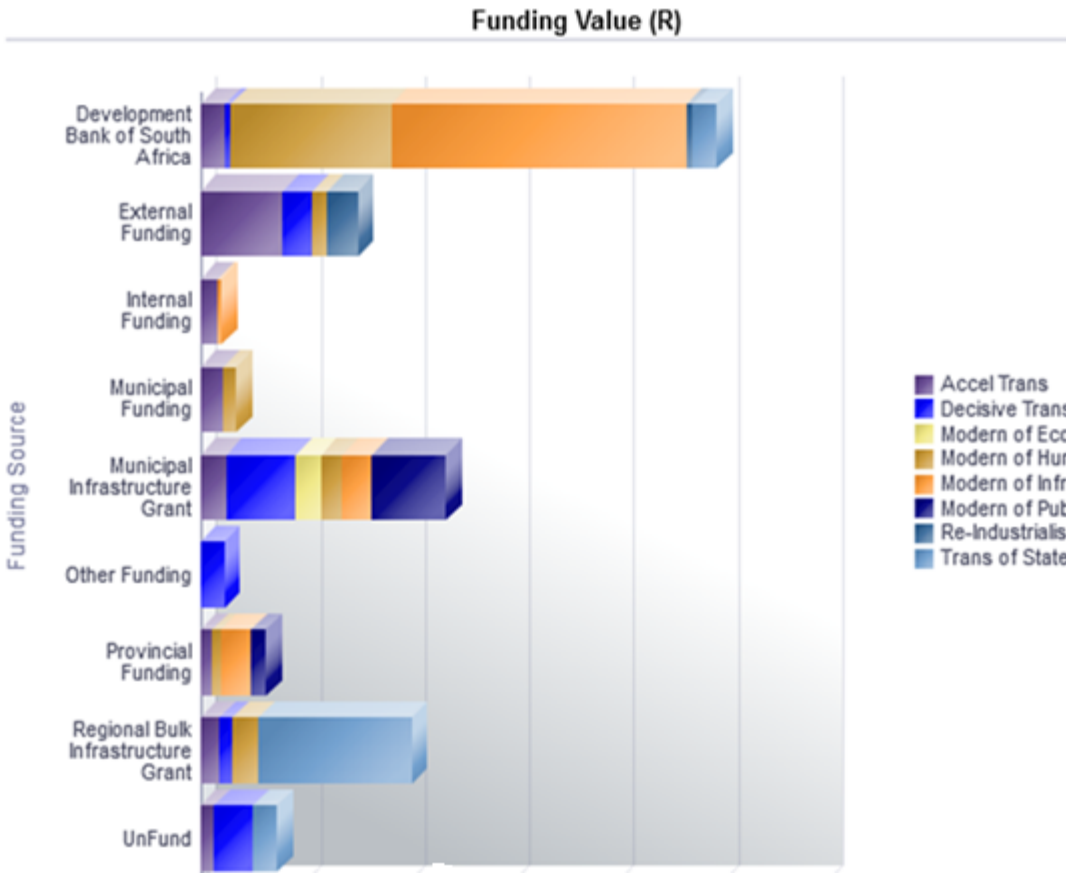
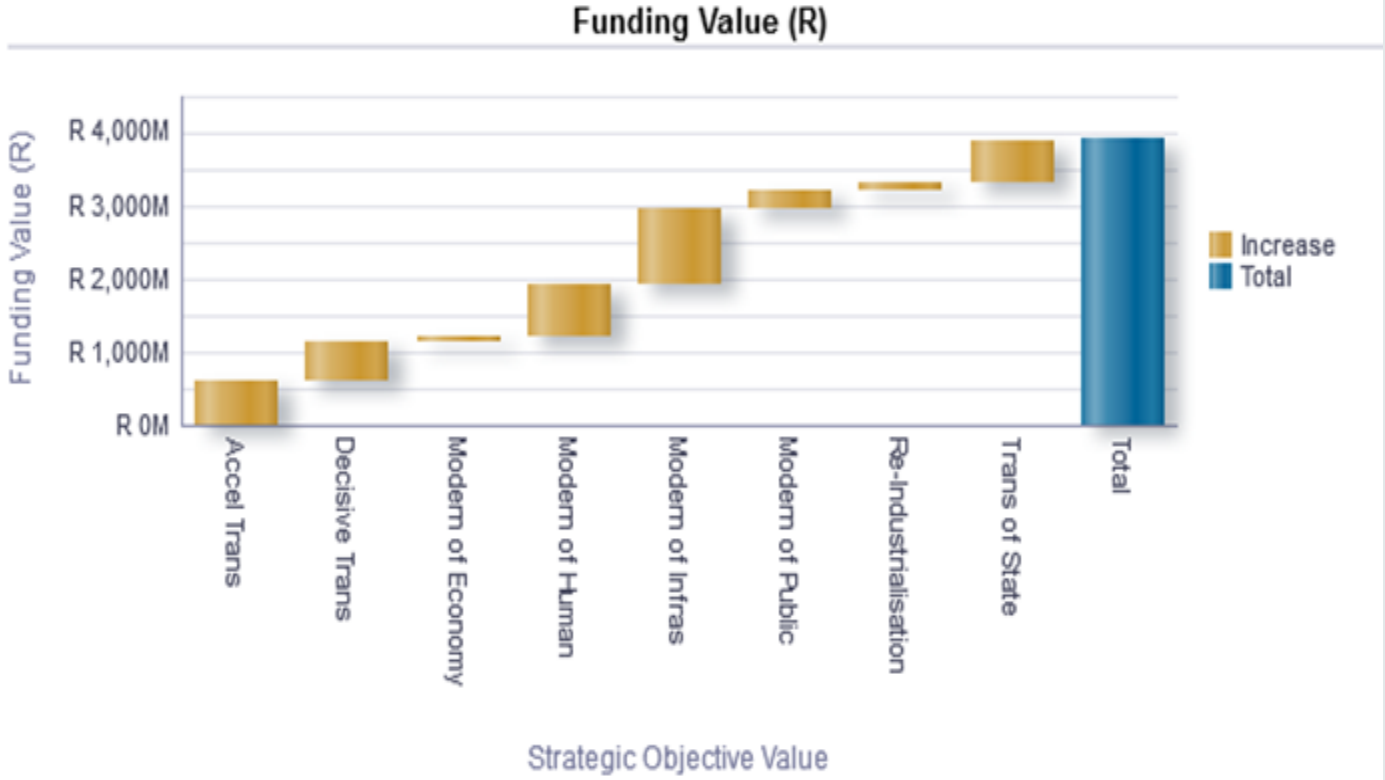
Q: Are we funding the correct strategic objectives?





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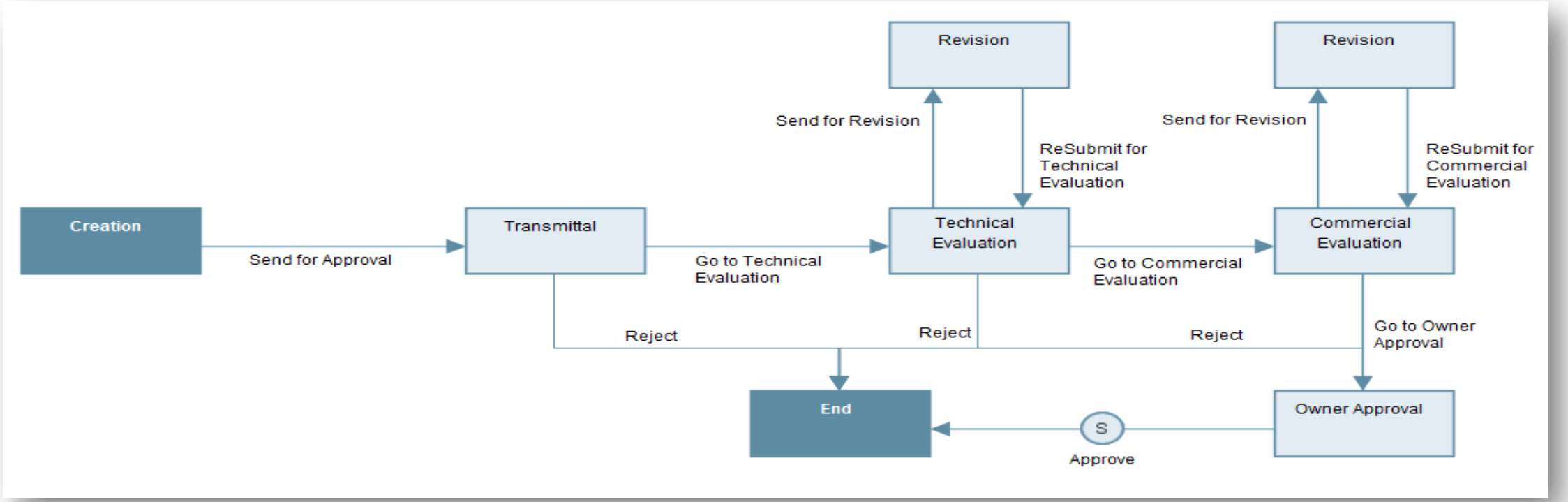
Q: Are we ensuring good governance?



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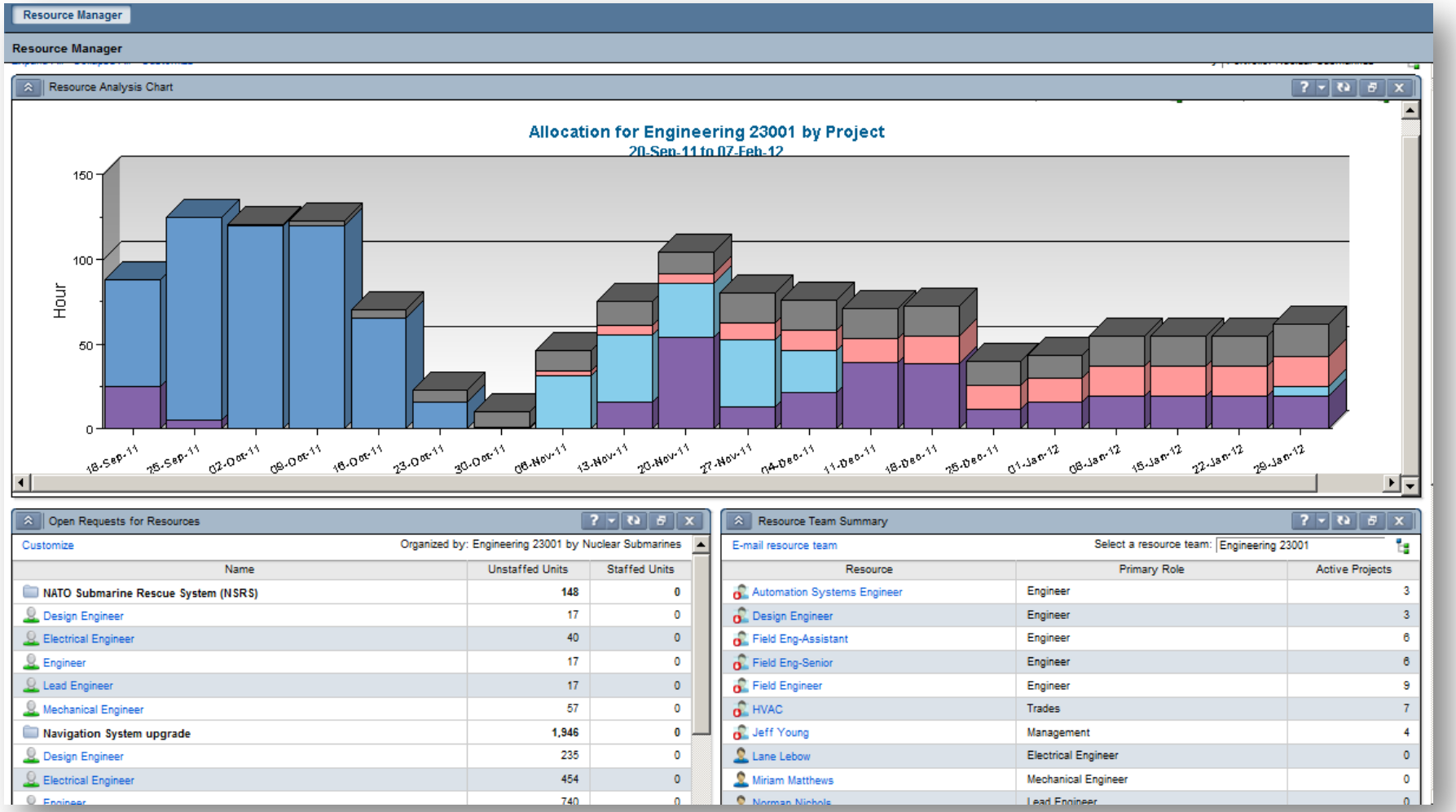
Q: What is our overall resource demand?



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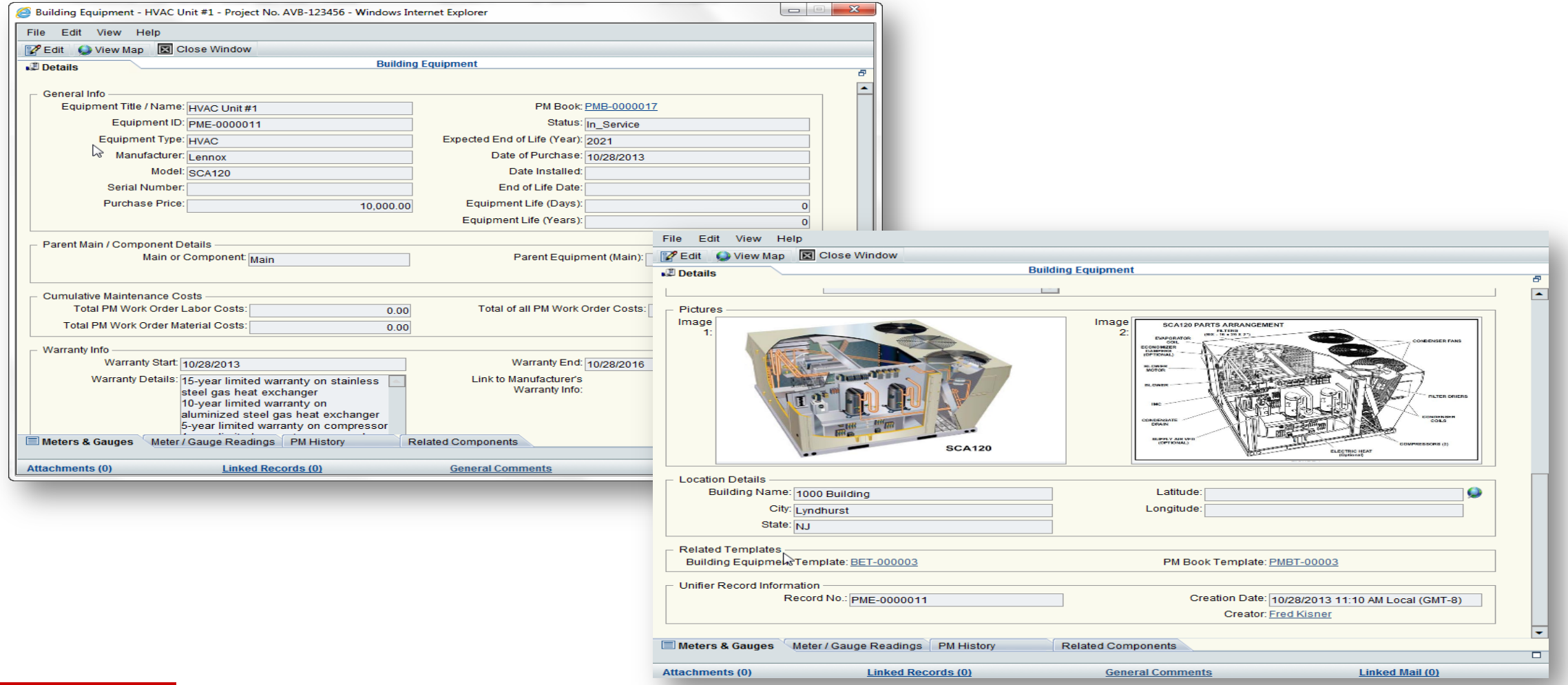
Q: Are we maintaining our current assets?



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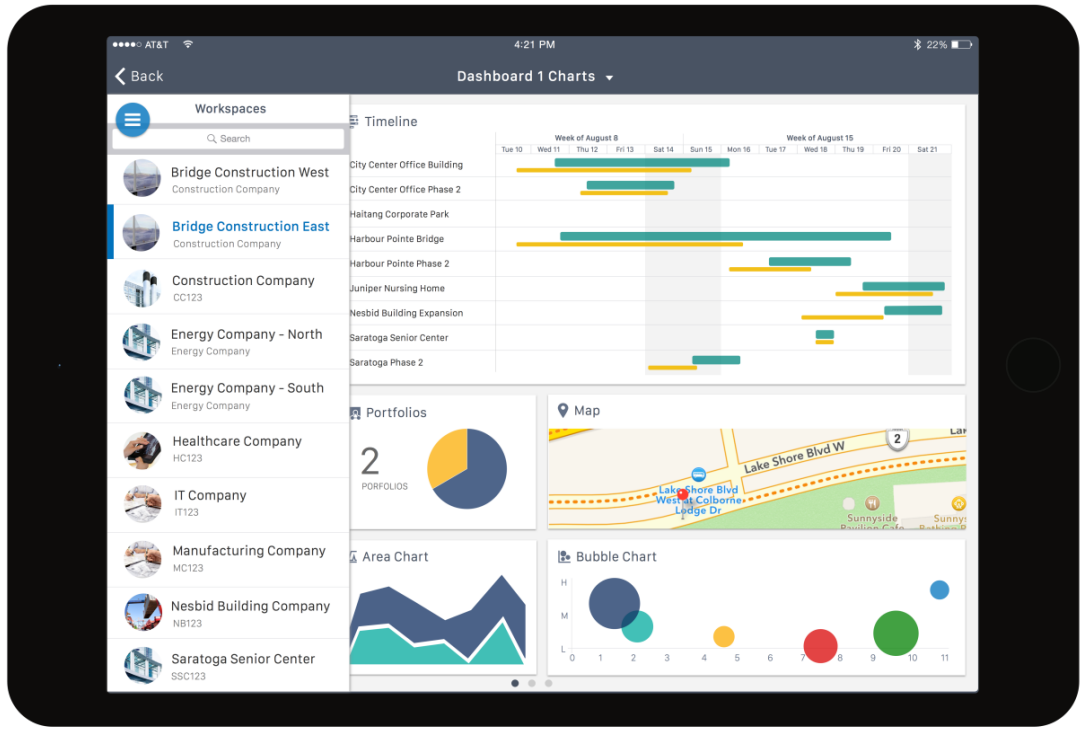
Q: Are our people working in a productive manner?



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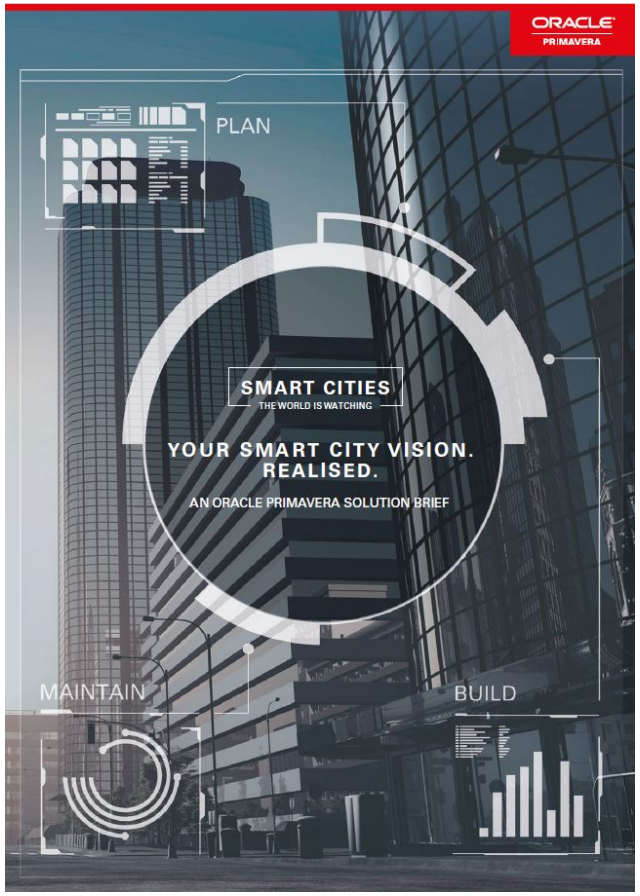
Discussion Paper



Solution Brief

Interactive Playbook

Action Worksheet

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