

# Program/Project Management Strategy for the Multi-Billion Dollars Mega Programs



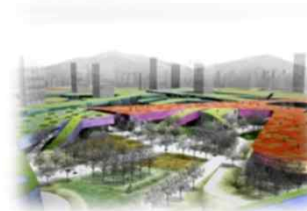
Nuclear Power Plant



High Speed Railway



International Airport



New Mega City

Bok Nam Lee, Professor  
Institution of Civil & Environmental Engineering(ICEE)  
Seoul National University

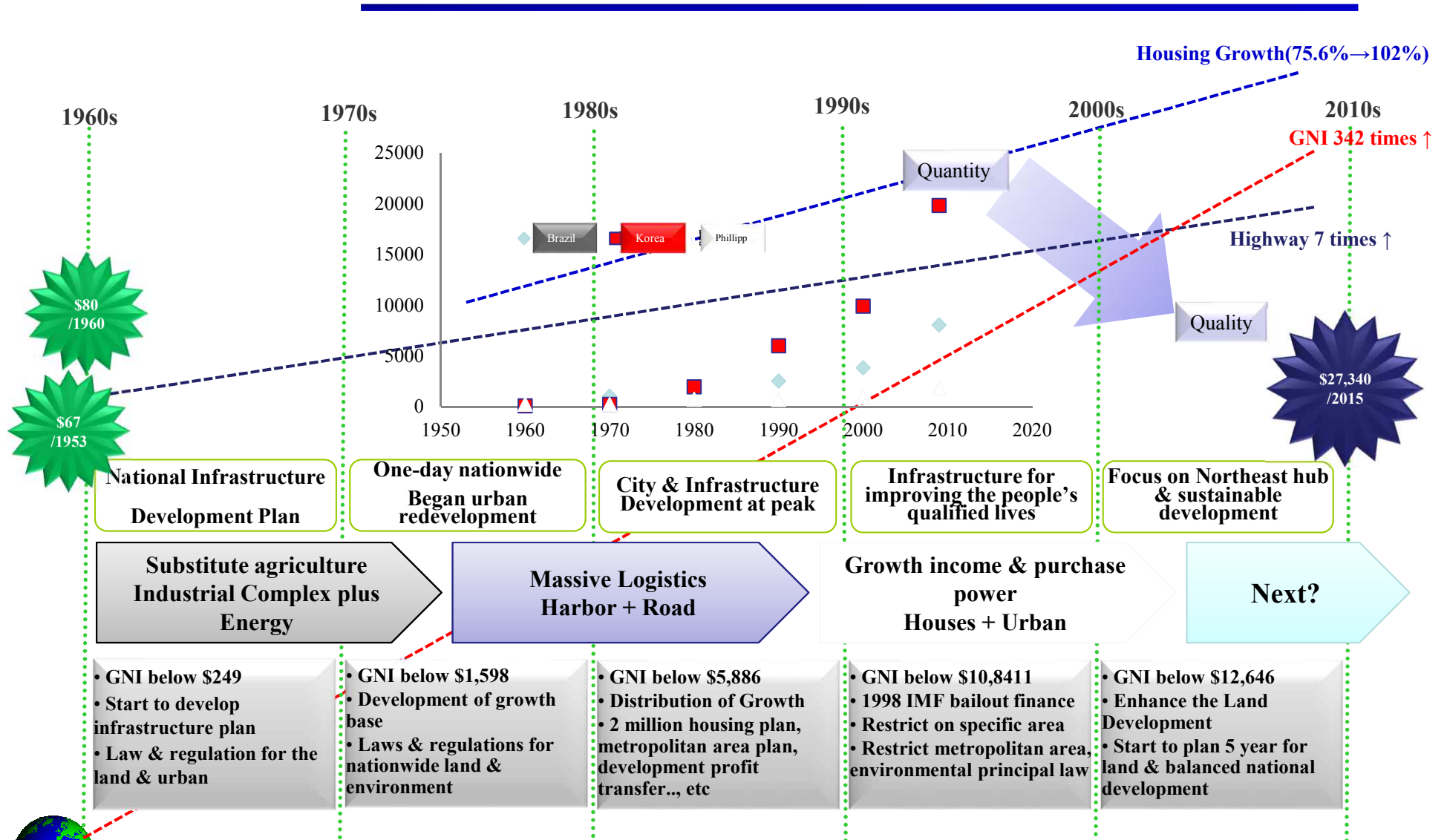
# Contents

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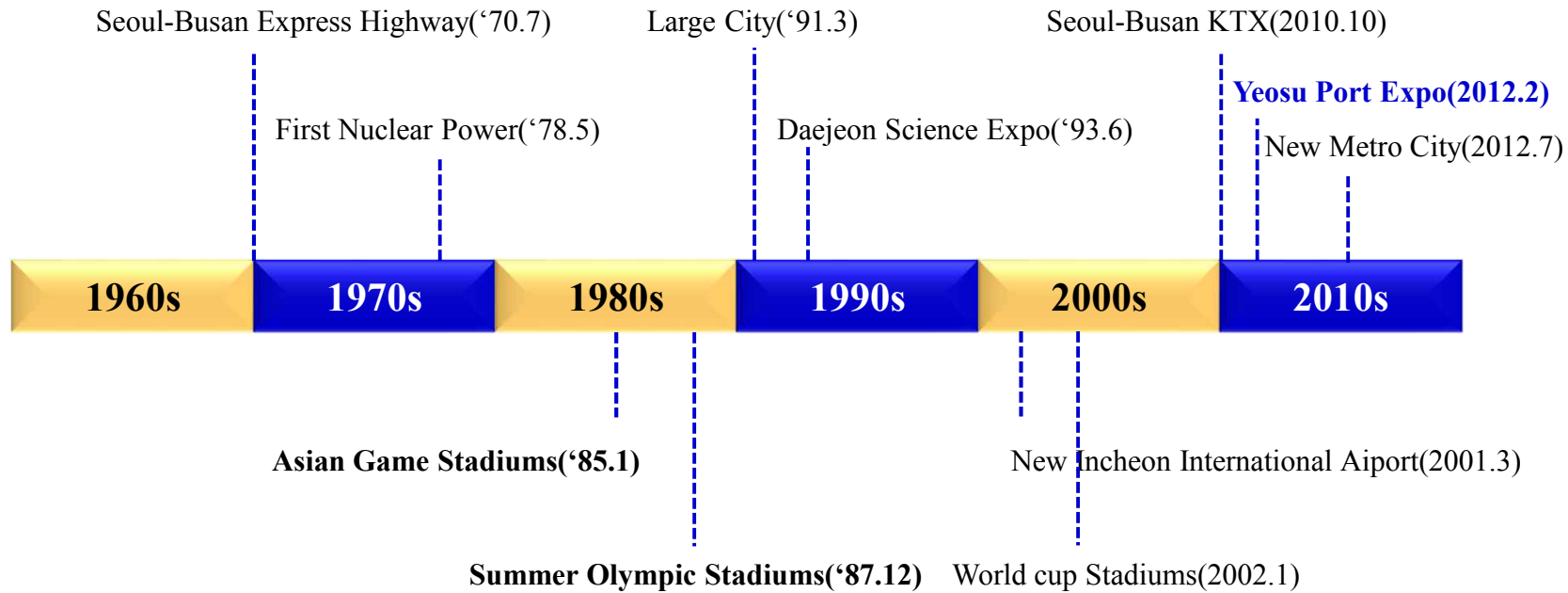
- Infrastructure Roles in Korean Economy
- Mega Project and Program Management in general
- Mega Project/Program Success and Failure
- Case Study – Mega City Development Program(MaCC)
- Conclusion



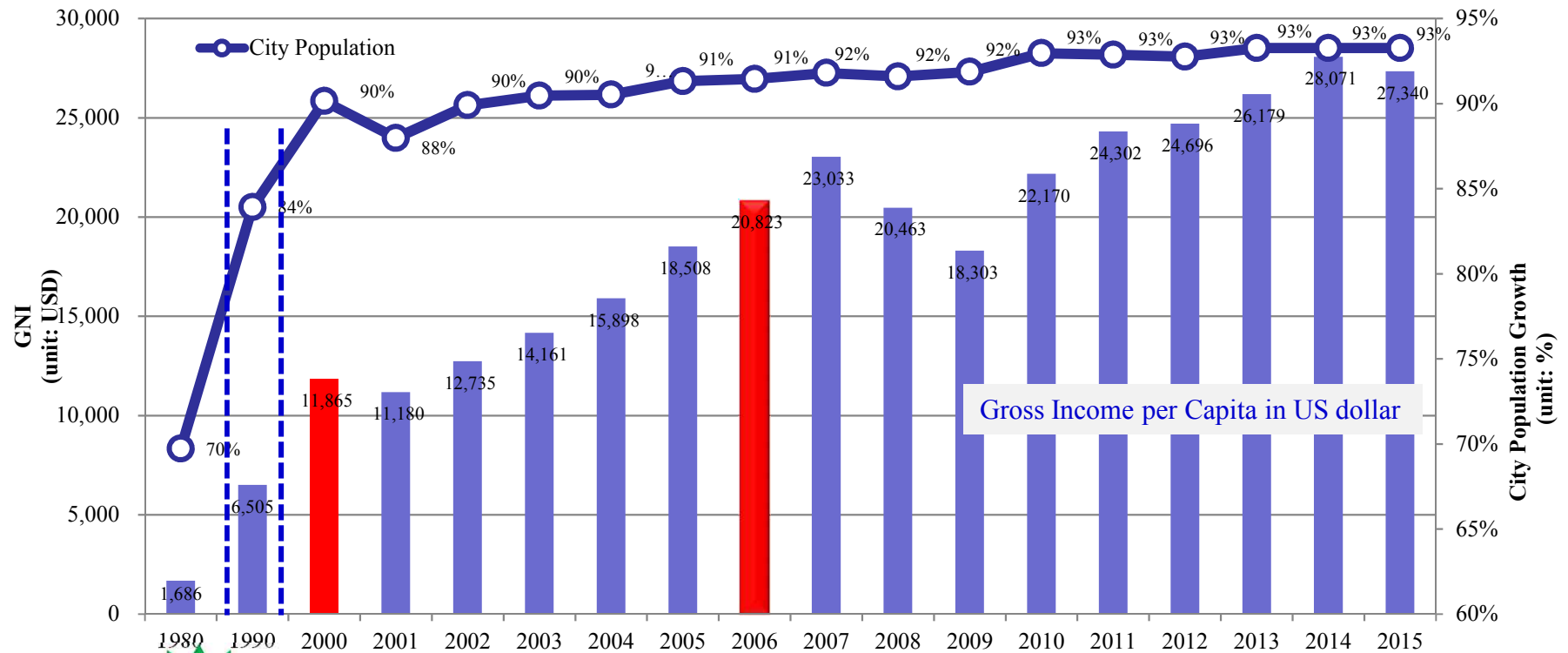
# Infrastructure Development vs Korean Economy Growth



# Key Milestones for the Infrastructure Development



# Population Concentration(urbanization) vs GNI growth

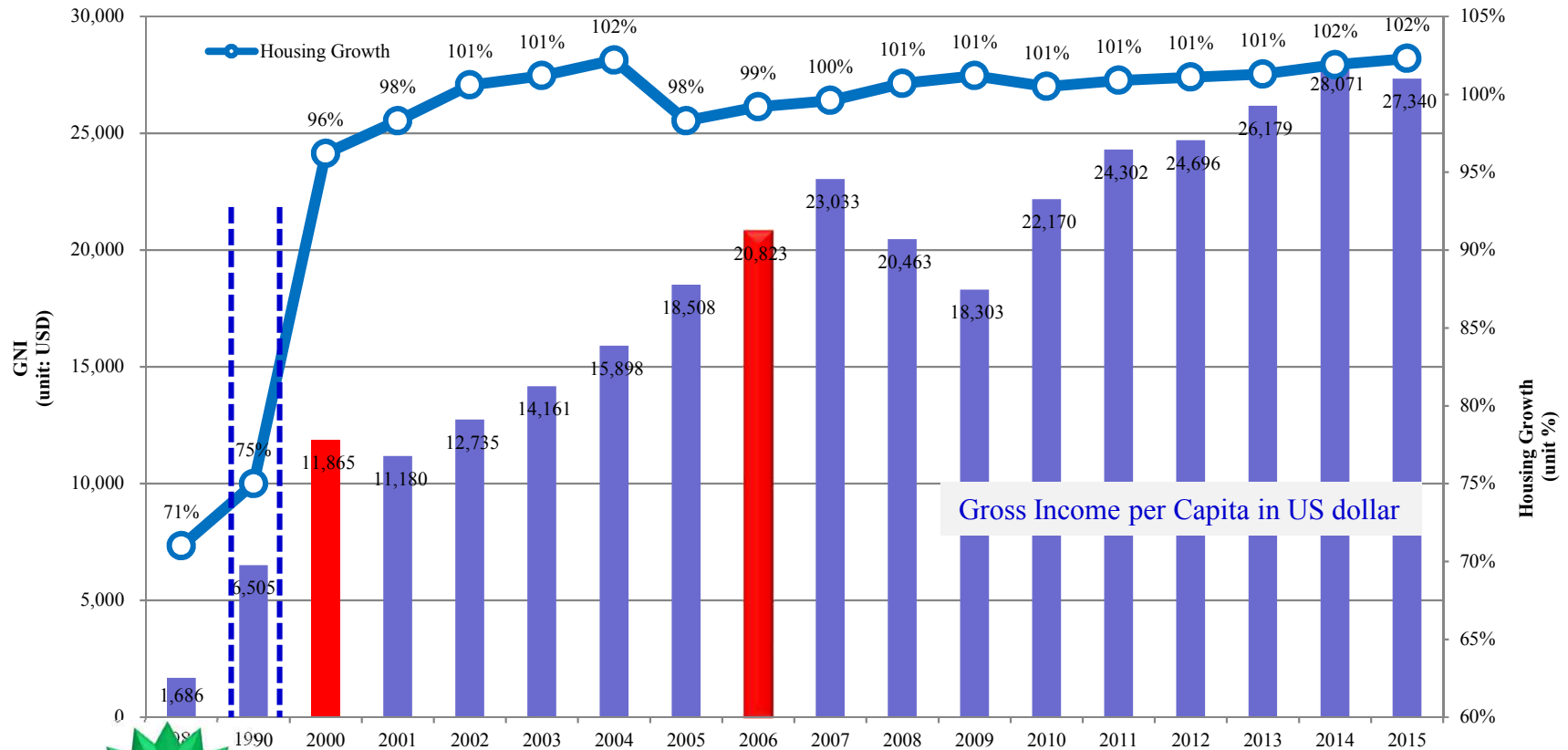


\$4,653 /1988

\$10,168 /1994



# Housing Supply Ratio Growth vs GNI



Gross Income per Capita in US dollar

\$4,653 /1988

\$10,168 /1994



## What is Construction?

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**Construction** refers to the  
**integration** of PLANNING,  
DESIGN, PROCUREMENT, BUILDING  
AND STARTUP  
of a project that delivers facilities and  
relevant services

\* By PMI(US Project Management Institute)



## What is Project/Program & Management ?

The **Project** is a temporary endeavor undertaken to create a unique **PRODUCT or SERVICE.**



The **Project Management** is the application of knowledge, skills, tools and techniques to project activities to meet project requirements.

The **Program** is a group of related projects managed in a way to obtain benefits and control not available from **managing them individually.**



The **Program Management** is the centralized, coordinated management of a group of projects to **achieve the program's strategic objectives and benefits.**

\* Based On PMBOK



## PM Scope & Responsibility

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- Project/Program Planning
- Program **Scope** Management
- Program **Time** Management
- Capital **Cost** Estimate
- Program **Cost** Management
- Program **Quality** Management
- Program **Environment** Management
- Program **Safety** Management
- Program Accounting Management
- Design & Engineering Management
- Data & Document Control
- Program **Procurement/Contract** Management
- Construction Planning & Management
- Utility Safety, Reliability and Commissioning Planning & Management
- Program **Human Resource** Management
- Program Administration
- Program **Information** Management
- Program **Risk** Management
- Program Financing Management
- Licensing & Permit Management
- Marketing and Public Relation



## What does Project/Program Success ?

### Project/Program on TIME

Less than Planned Time

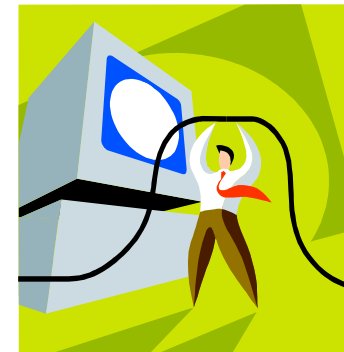
### Project/Program within BUDGET

Less than Planned Budget

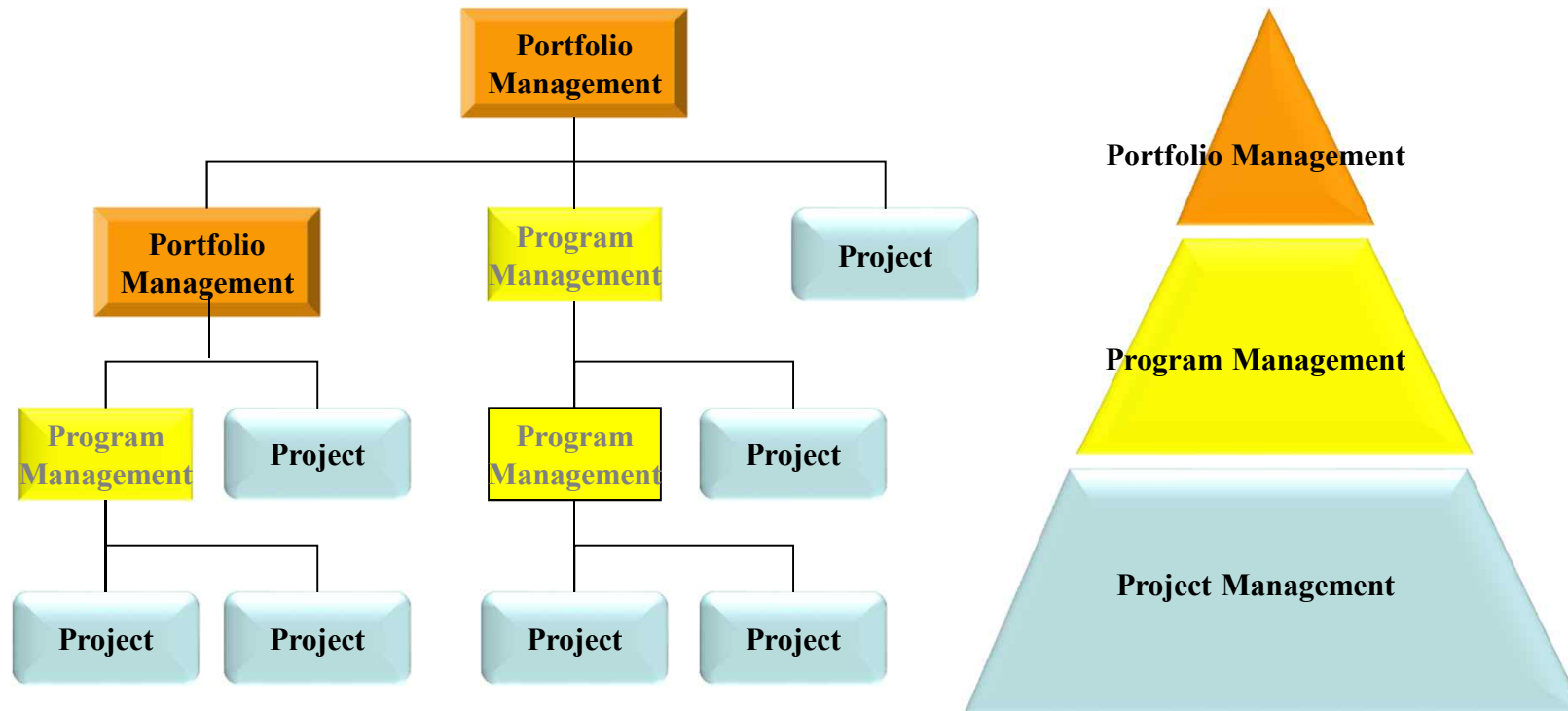
Meet the **QUALITY**

More than Requirement

The Project/Program finishes with  
Final the Physical and/or Service  
Deliverables



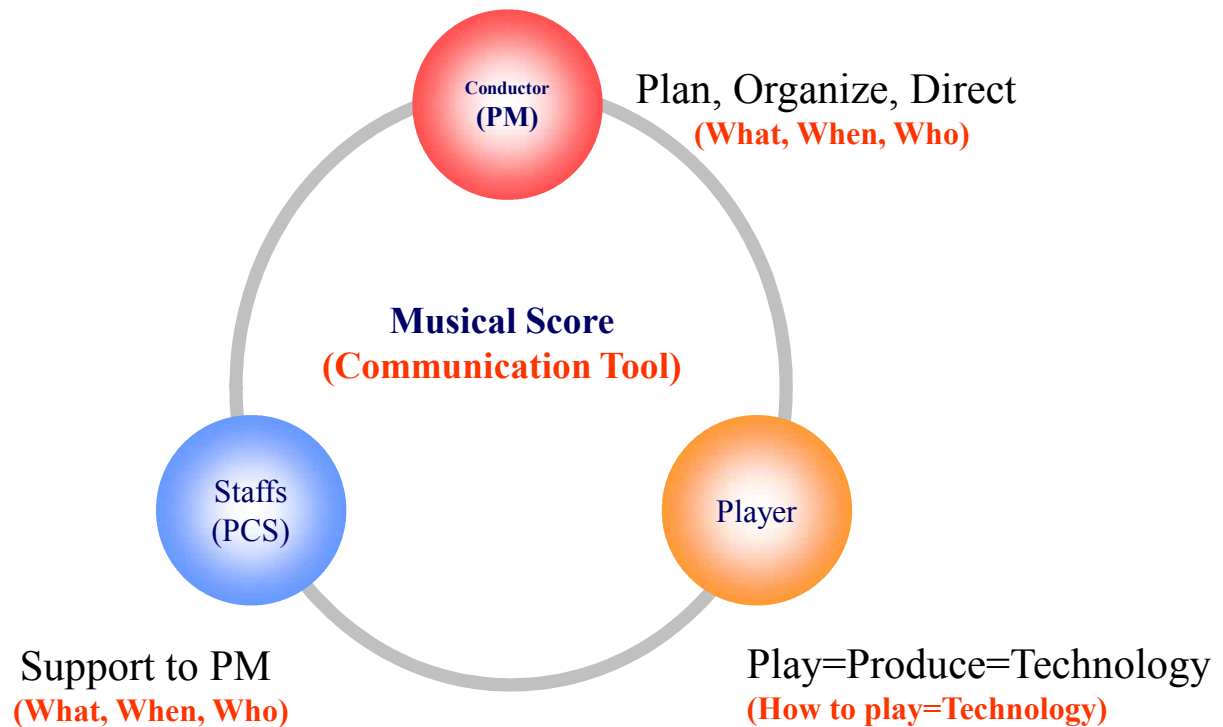
# Project/Program Hierarchy



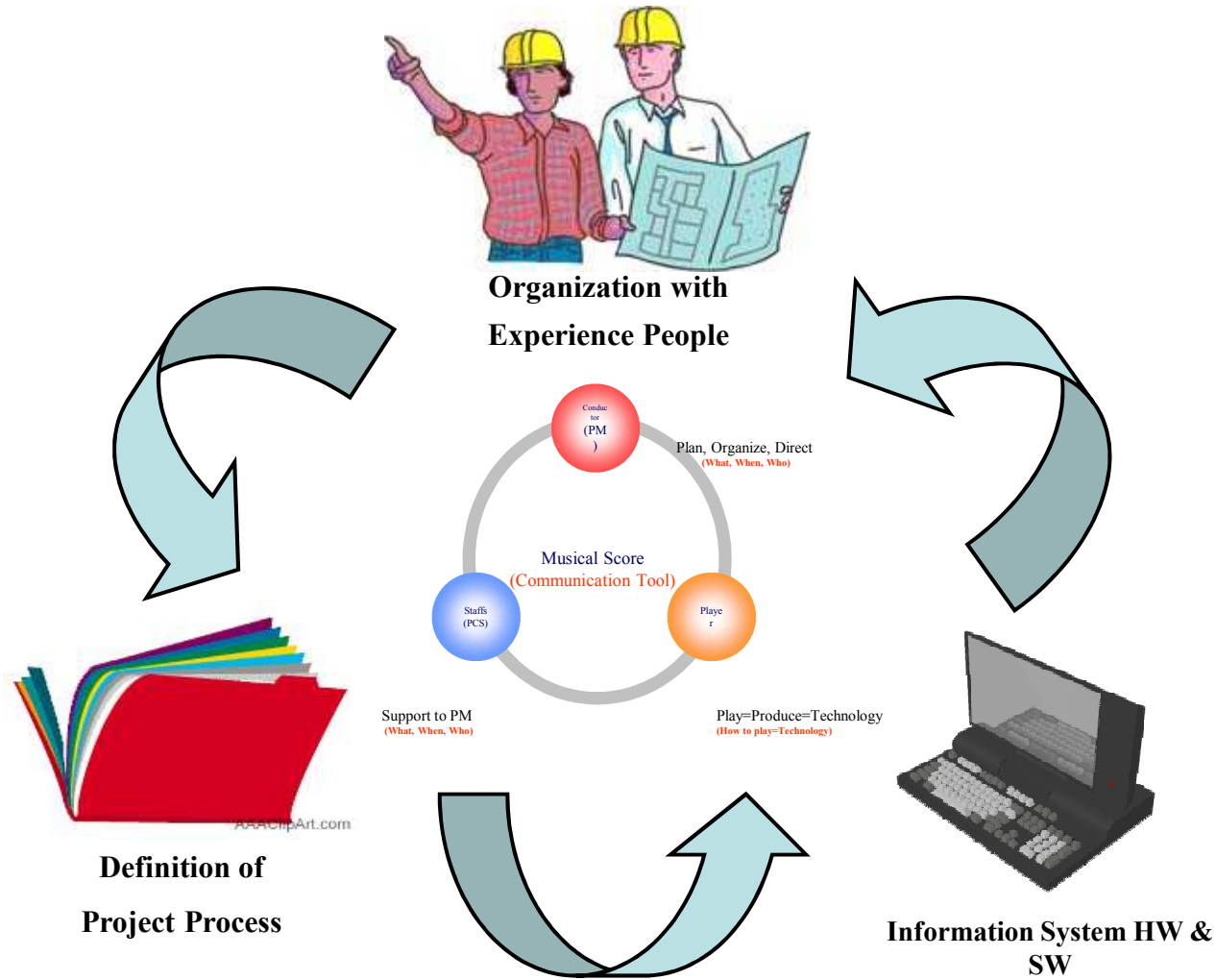
## Management integrates process and products



**Construction** refers to the integration of **PLANNING, DESIGN, PROCUREMENT, BUILDING AND STARTUP** of a project that delivers facilities and relevant services



# Program Management System Configuration Plan



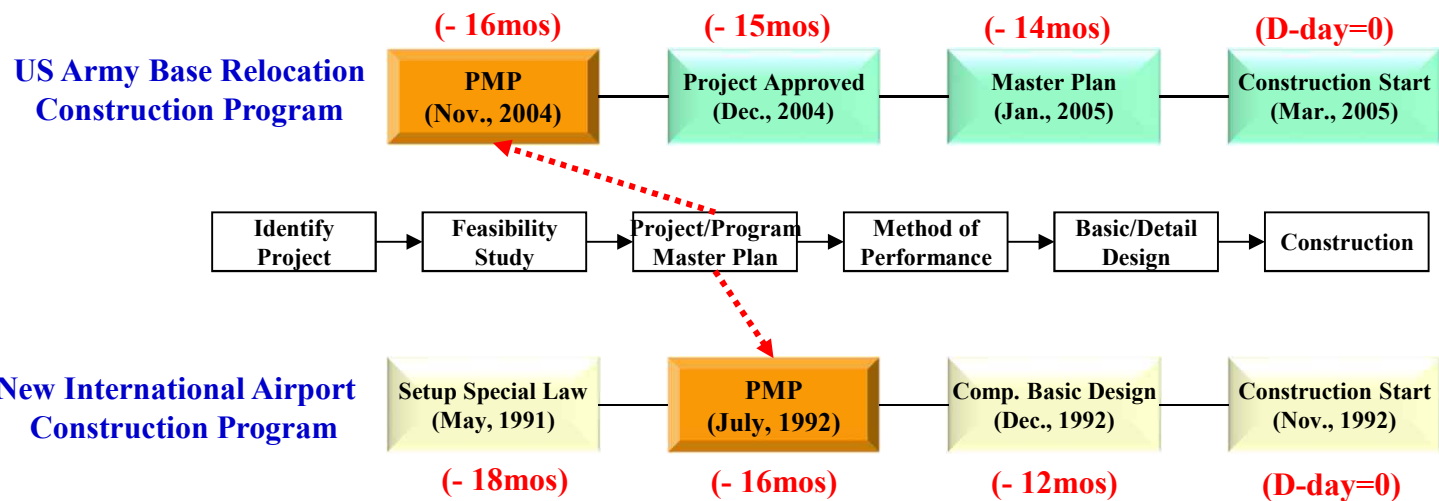
# Strategy Development Process

## ■ Experiences and Low Uncertainty

- No need extensive pre-study
- One can start to develop the Project/Program Management System

## ■ High Risk and High Uncertainty

- Need to assess the environments
- The Project Management Plan, PMP is preferable



# Anticipated Benefits from Successful PM

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## ■ Program Schedule

**On Time Completion or**

**7% Reduction of program duration**

## ■ Capital Cost

**Within Budget Completion or**

**5% Saving of Capital Cost**



## The Characteristics & Risks of the New Mega City Development

### ■ The Characteristics

- Long duration and large scaled investment with multi-complex facilities
- Various Stakeholder Group
- The Centralization of Project Management Responsibility and Authority
- Weak PM Organization and Missing of Strong Driving Forces
- Improper Program Master Plan and Weak Implementation
- Much Tardy in Licensing & Permit

### ■ High Risks

- Schedule Delay & Capital Cost Overrun
- Program Delay and/or Suspension due to Stakeholder Group
- Poor and Improper Program Management Professional Skills
- Speedy Fast Tracking might make the Failure due to the Lack of Coordination of the multi-complex facilities

**Just 1% failure can burden to you , more than 100 million US Dollars !**



## Key Success Factor for a New Mega City Development

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- **Professions of Program Planning & Management**
- **Sharing of the Authority and Responsibility of the Planning and Coordination**
- **Strong Support for the Licensing and Construction Permit**
- **The Development & Implementation of the Program Management Oversight Control Tower**
- **The Dedicated PM Organization for the Program Driving Forces**
- **The Program Management Information System Support for the decision making on time**
- **Optimized Sharing of Responsibility & Authority between the Government Requirements and Program Management Organization**
- **The Strategic Public Relation for Public Consensus Buildup**



## Cases of Large Program Success and Failure

### ■ Failures

- **B Subway Program(\$ 2.5 Bil)**
  - 4 year delays, 156% cost overrun
- **S Highway Program(\$ 5 Bil.)**
  - 5 year delays, 150% cost overrun
- **B Artery Program(\$ 14.6 Bil.)**
  - 14 year delays, 570% cost overrun
- **A Airport Program(\$ 3 Bil.)**
  - 2.3 year delays, 145% cost overrun

### ■ Successes

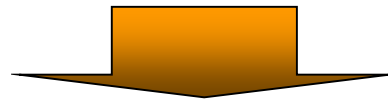
- **I Subway Program(\$ 3.1 Bil.)**
  - 3 mos reduction, within budget
- **S Highway Program(\$ 4.9 Bil.)**
  - 9 mos reduction, within budget
- **S City Innovation Program(\$ 360 Mil.)**
  - 3 mos reduction, 7% cost under-run
- **I Airport Program(\$ 6 Bil.)**
  - 8 mos delay, 7% cost over-run
- **Y Nuclear Power Program(\$ 4 Bil.)**
  - 3 mos reduction, 3% cost under-run



## What you get from the PMS success?

- **Time Wise**
  - On Time or Time Reduction by 7%
- **Capital Cost Wise**
  - Within Budget or Cost Savings by 5%

**000 Mega City Development Case I**  
**Planned 120 months, US \$5 billion**  
**Actual 111 months, US 4.75 billion**



**The Mega City Development Program Success**  
**Had been governed by the PMS, not by the technology**



## What you lose from the PMS failure?

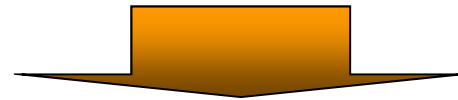
### ■ Time Delay

- Time delayed more than 50% than planned, expected up to the 95%

### ■ Cost Overrun

- Cost overrun by 200% in average, up to 320% than budget

**000 Mega City Development Case II**  
**Planned 120 months, US \$5 billion**  
**Actual 204 months, US 13 billion**



**The Mega City Development Program Failure**  
**Planned by 2020 → Actual 2027(84 months delay)**  
**Budget US 5 billion → Actual US \$13 billion(8 billion ↑)**



## Implications from the Project Success

### ■ Critical Failure Factors

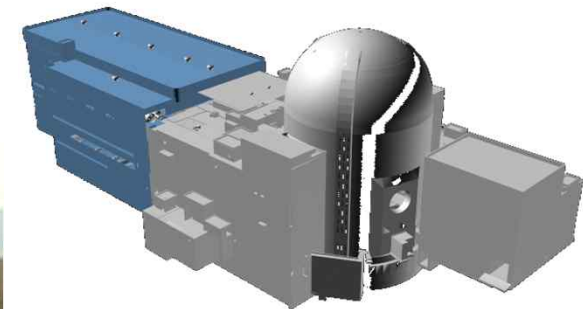
- Integration Missing
- Loss of Ownership
- Persistence on Railway Technology
- Lack of PM Ownership and Knowledge

### ■ Critical Success Factors

- CEO'S Clear Ownership
- Open to Airport Technology
- 'Owner=PM Ownership'
- Well Organized PMS
- Integrated Program Management Office

### ■ Critical Success Factors

- 'Owner=PM Organization'
- Clear Differentiate between Production and Process
- Utilization external PM Services
- Well Organized PMS
- Clear Target on Time & Cost



## Lessons Learned

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### ■ Critical Success Factors in Construction Program

- Ownership & Clear Objectives
- Assessment & Critics on Self Capability
- More Governed by Management than Technology
- Take Timing more than Perfection

### ■ Differentiation between City Development and Others

- Program Management System Reliability
- Sharing Information in Stakeholders
- Easy to Access and to Use, user-friendly
- More Bystanders than Supporters
- Big Issues on Conflicts Management



## Political Goal for MaCC Construction Program

Competitiveness & National Integration

Futuristic & World Class City

### Balanced Development

- National Balance
- Land Develop. Innovation
- Contribution to Integrate



### World Class City

- City Environmental Upgrading
- Vision of Tech. & Culture
- Benchmarking for New City



**As of July 31, 2006**

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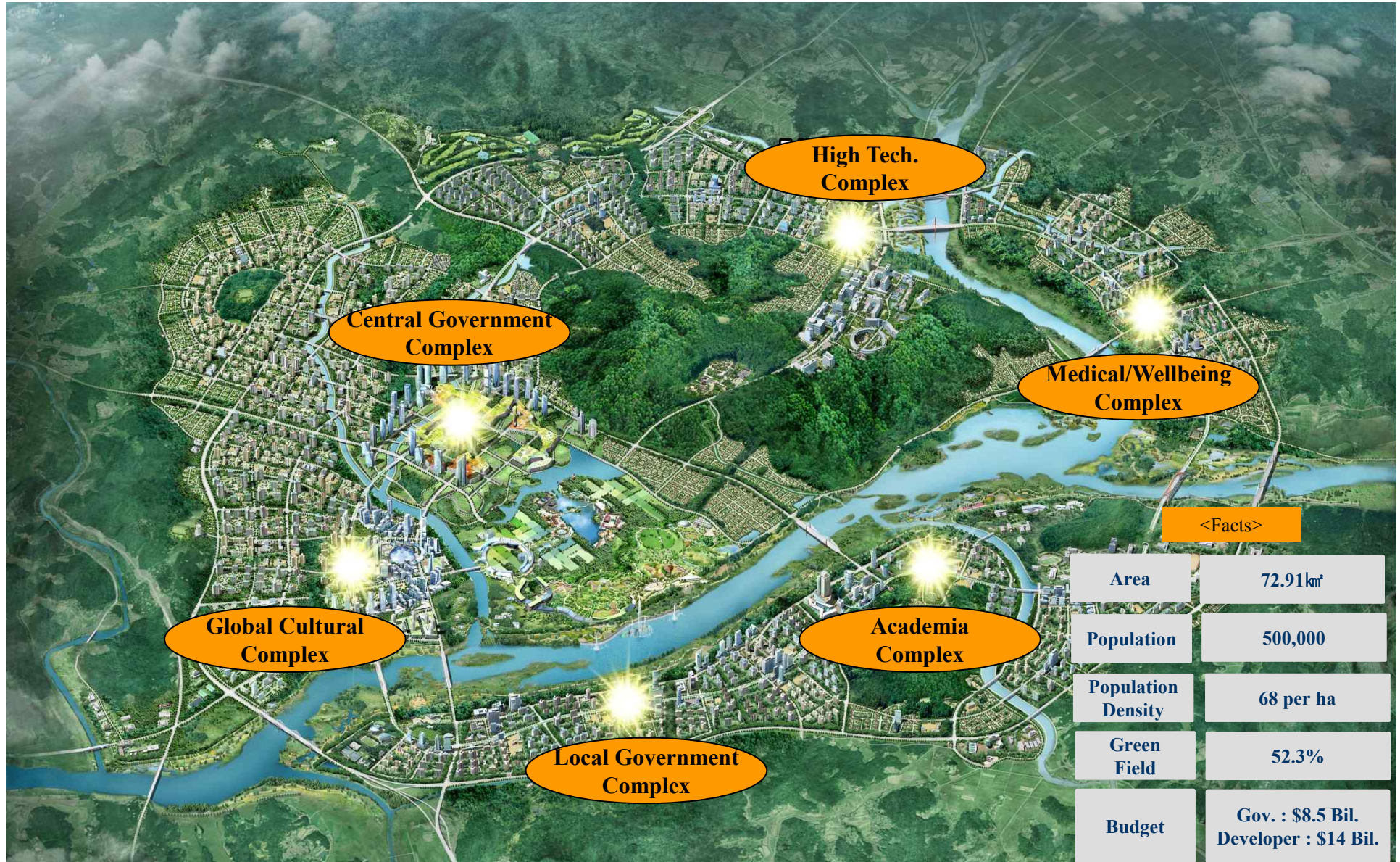


**As of March 31, 2017**

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As of December 31, 2030

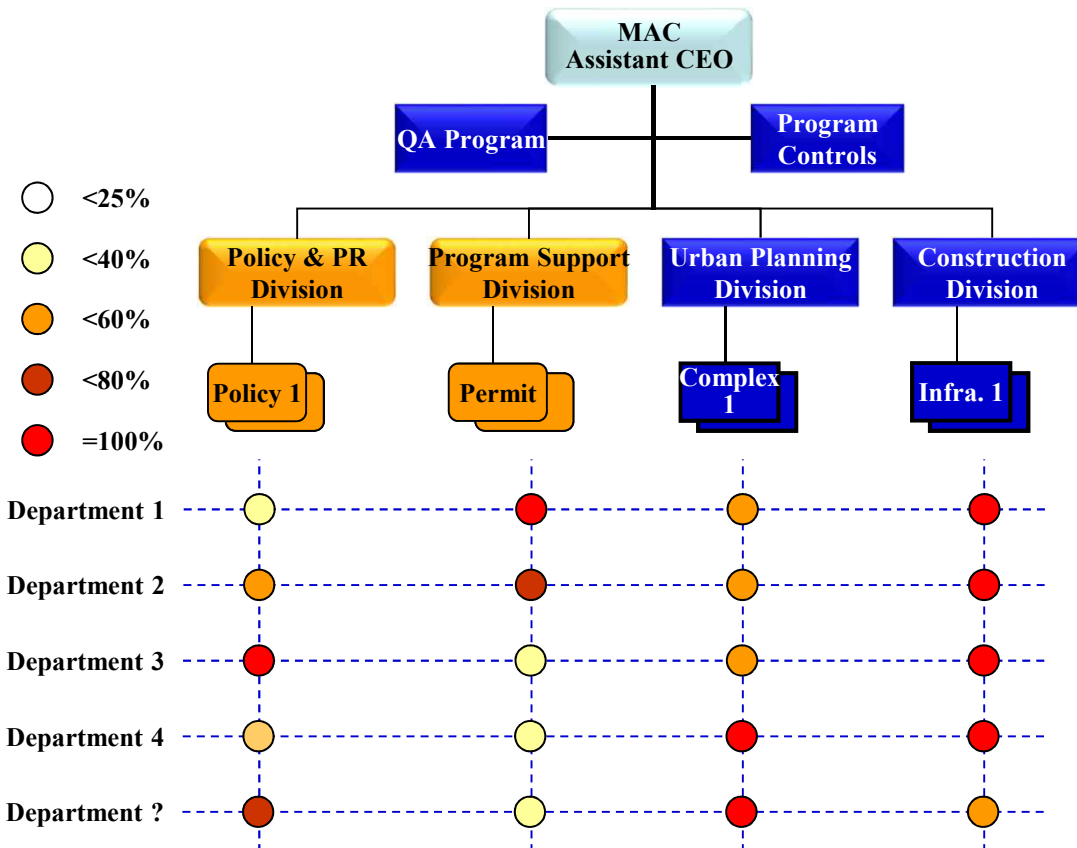
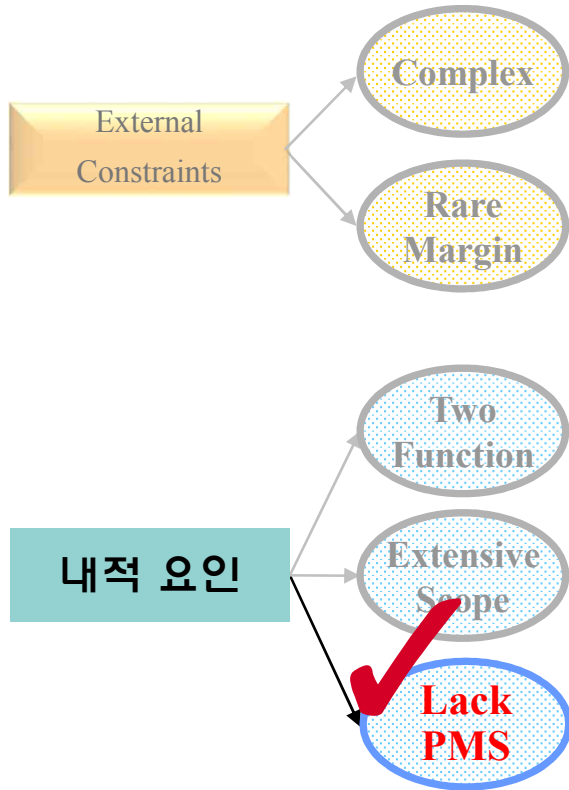


# MaCC's Management Principles



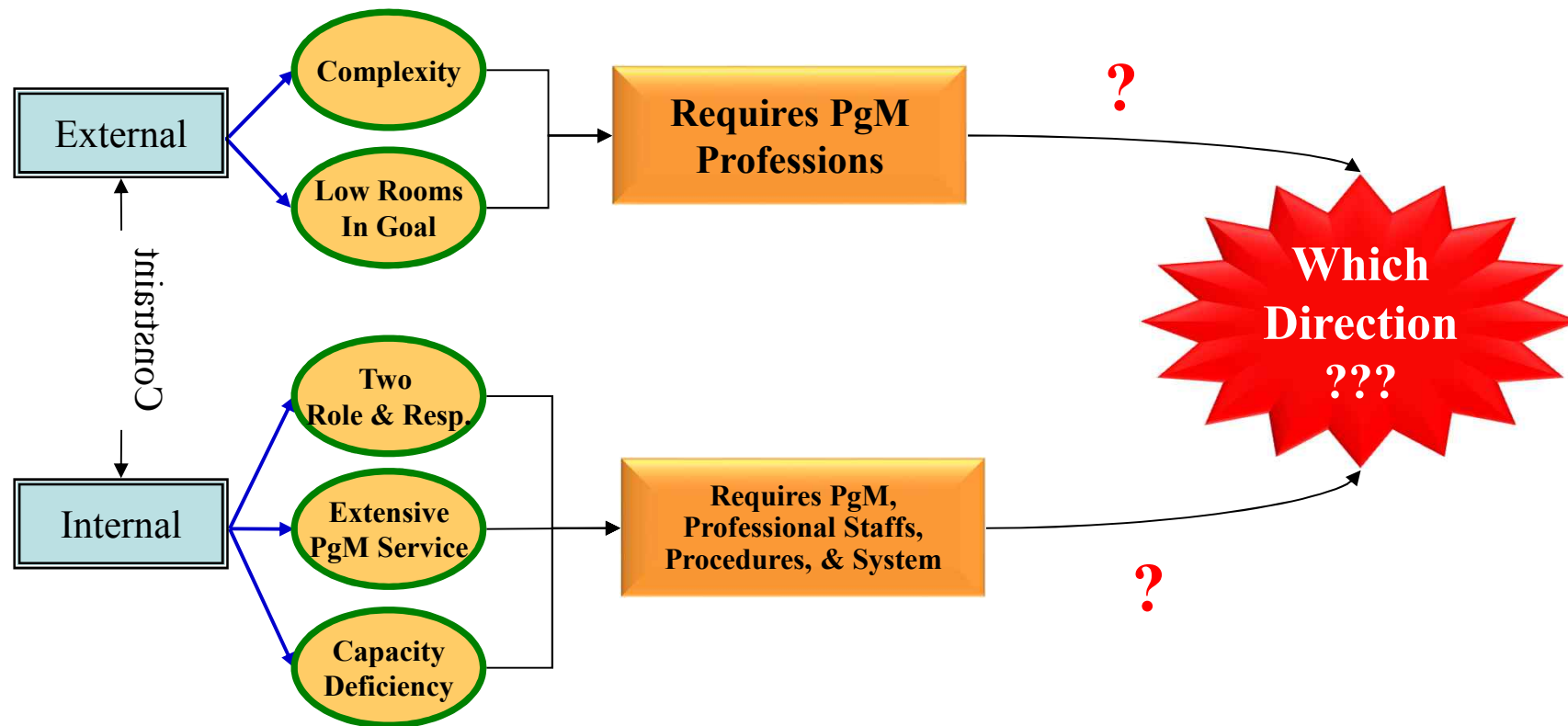
# Program Management Task Assessment

- Owner Group Task Assignment Assessment
  - ✓ Around 65% of time spends on routine task
  - ✓ Only 35% of time spends on program management task



# Decision Making on Program Management Direction

- The assessment indicates that MAC definitely needs strong reinforcement of the Program Management capability enhancement.



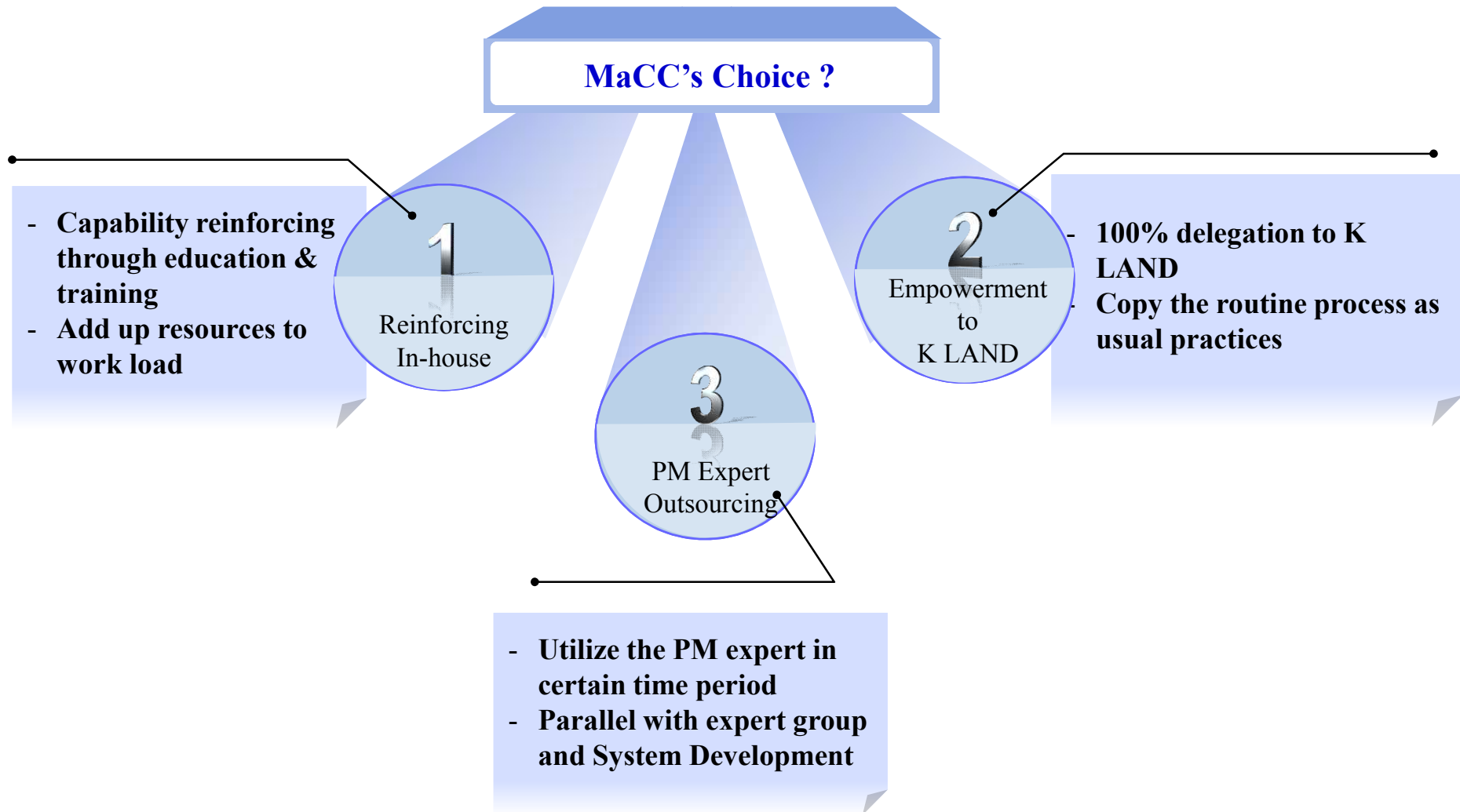
## Most Urgent Issues are....



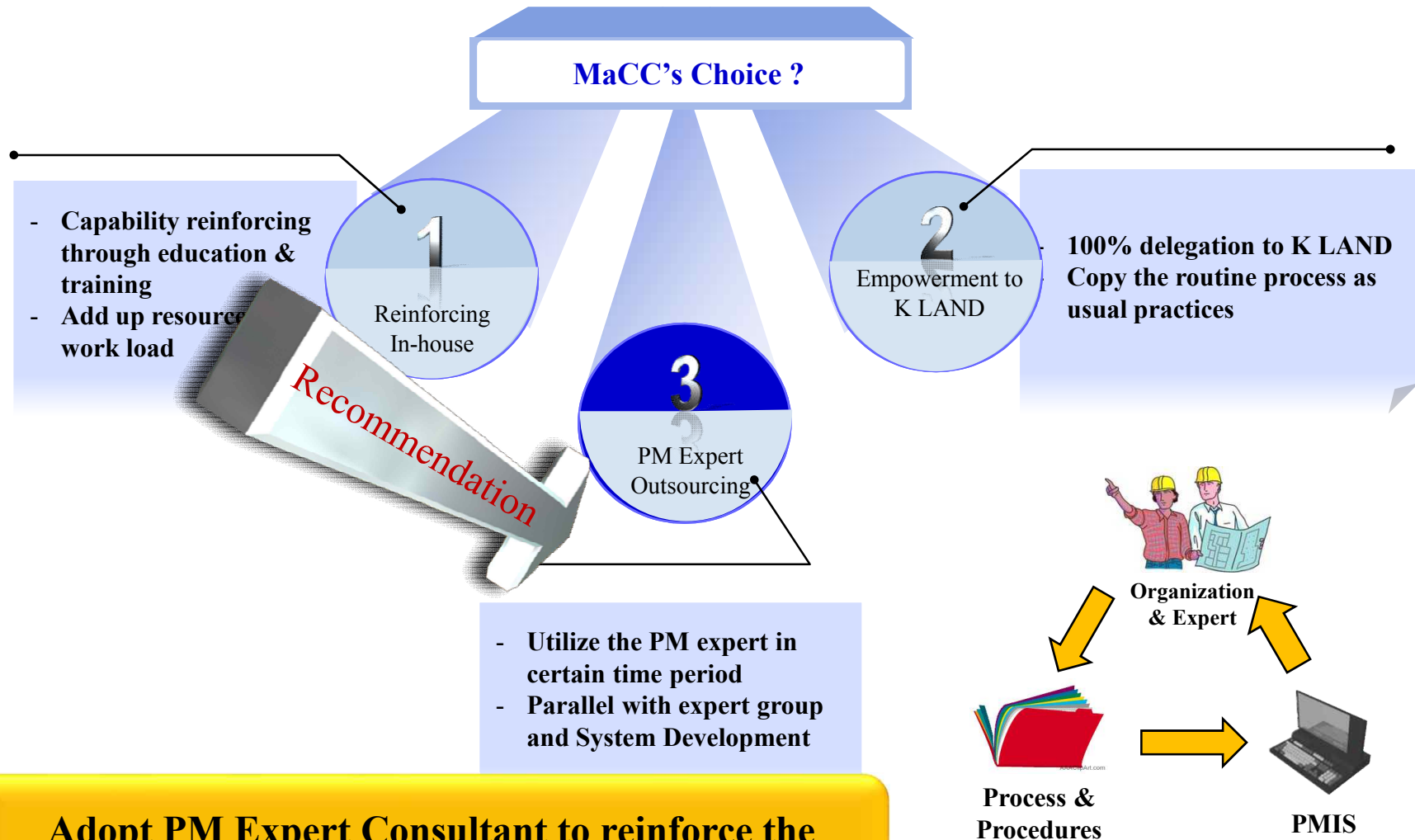
- **Definitely Needs the Strong Leadership for Single Direction**
- **MaCC should reinforce the Program Management Capability**



## What is MaCC's Choice for PM Expertise Upgrading?



## Recommended Solution after Review

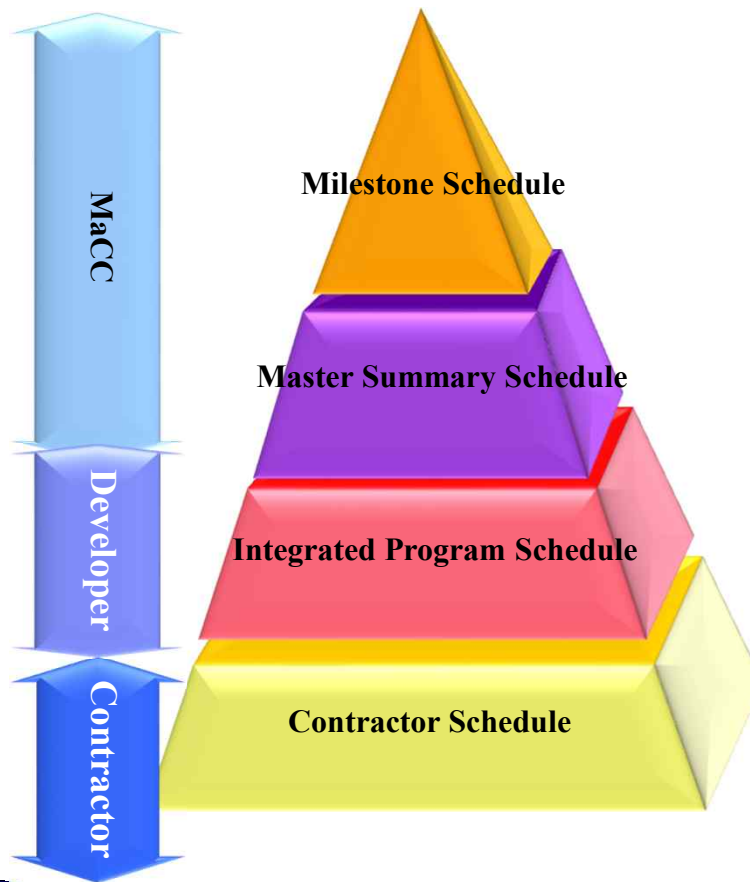


**Adopt PM Expert Consultant to reinforce the MaCC's Program Management Capability**



## Program Management Hierarchical Structure Plan

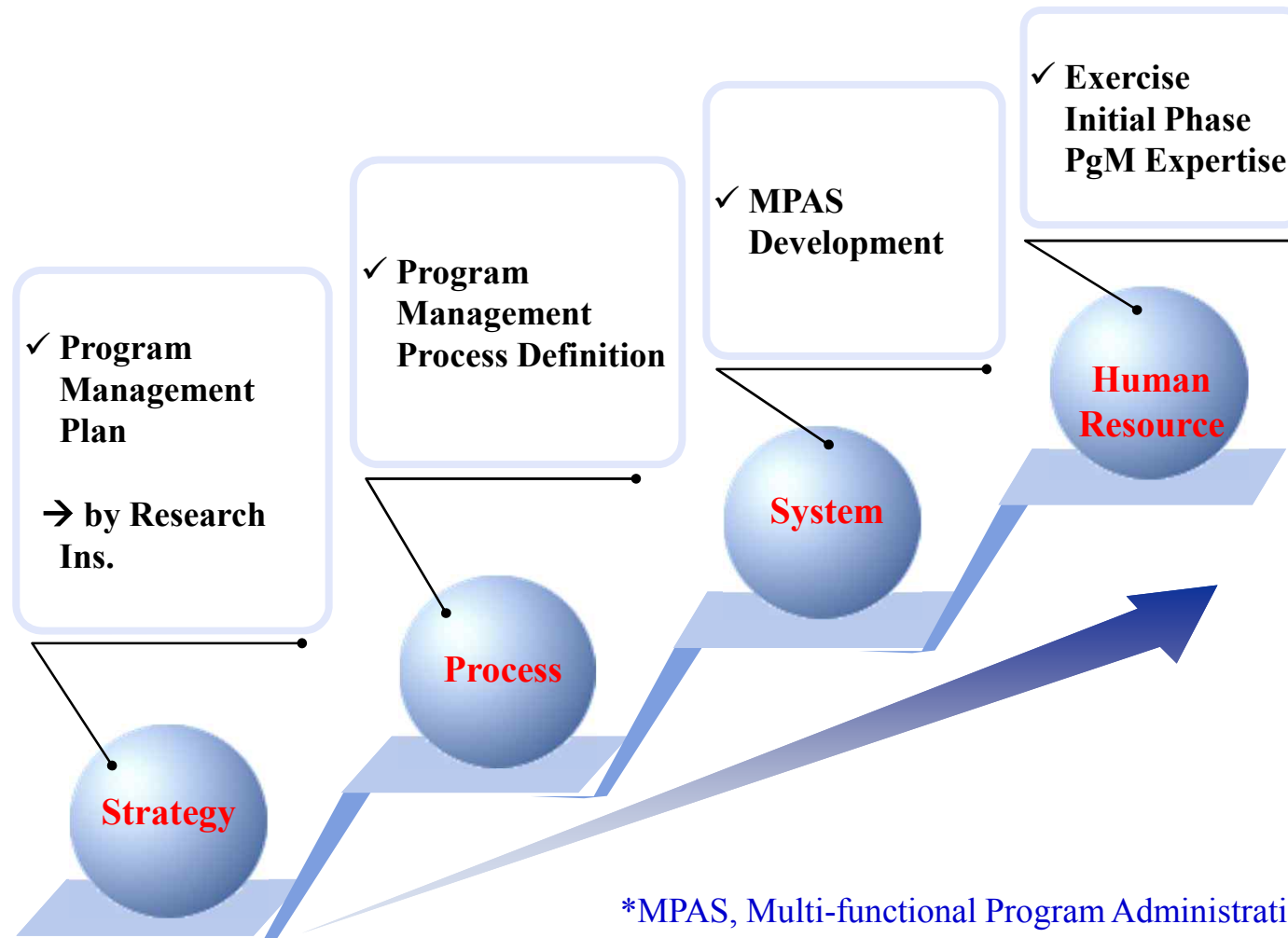
- MaCC should be responsible to manage the program target schedule



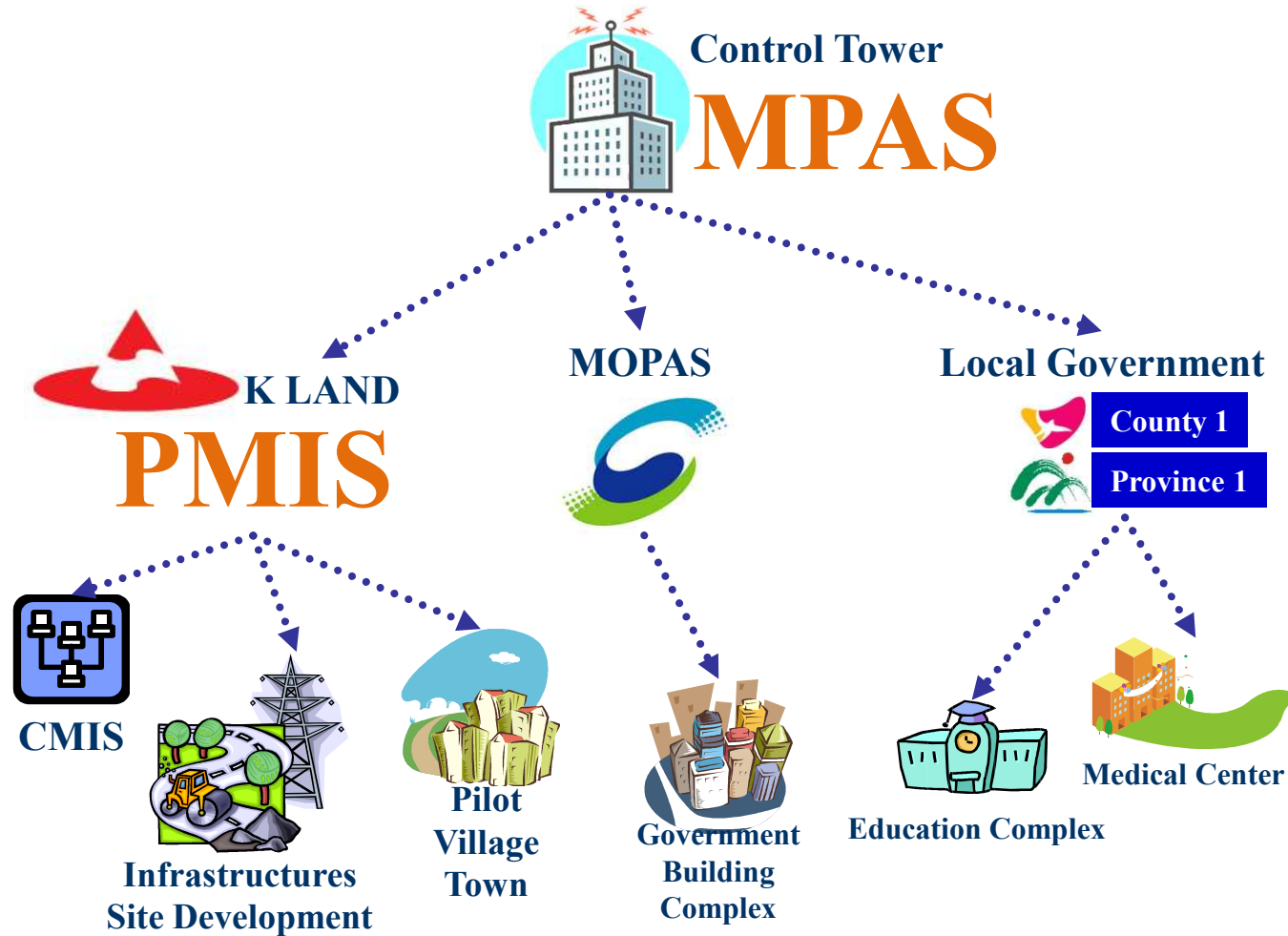
Owner	Purpose	Depth of Detail/Technology
MaCC	Manage Milestone	<ul style="list-style-type: none"> <li>▪ Less than 50 Line Item Work</li> <li>▪ 1 Sheet on Bar Chart</li> </ul>
MaCC	MaCC Level Time Control	<ul style="list-style-type: none"> <li>▪ Schedule by WBS</li> <li>▪ By Complex/Area/Developer Schedule</li> </ul>
Developer	Developer Level Time Control	<ul style="list-style-type: none"> <li>▪ WBS based Schedule</li> <li>▪ Schedule by Contract Package</li> </ul>
Contractor	Contractor Level Time Control	<ul style="list-style-type: none"> <li>▪ WBS based Schedule</li> <li>▪ Contract Package Detail Schedule</li> </ul>



## Program Management System Development Process



# MPAS functional requirements **\_ continued**



## MPAS relationship with other System **\_example**

	MaCC MPAS	Individual PMIS
<b>Managing Scope</b>	<ul style="list-style-type: none"> <li>▪ Oversight on total site area</li> </ul>	<ul style="list-style-type: none"> <li>▪ Dedicated facility and area</li> </ul>
<b>Management Level</b>	<ul style="list-style-type: none"> <li>▪ Milestone &amp; Summary</li> <li>▪ Object : by Complex unit</li> <li>▪ Task : Plan, Site Develop, Design, Procure and Construction...,etc</li> </ul>	<ul style="list-style-type: none"> <li>▪ Integrated Project Schedule</li> <li>▪ Object : Block or Facility unit</li> <li>▪ Task : Major Commodity Level</li> </ul>
<b>Information Level</b>	<ul style="list-style-type: none"> <li>▪ Summarization from the local PMIS</li> <li>▪ Performance based information processing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor reporting</li> <li>▪ Time &amp; Budget : CPM and Budget Estimating by Commodity Accounts</li> </ul>
<b>Responsibility</b>	<ul style="list-style-type: none"> <li>▪ Authority : Decision on Planning</li> <li>▪ Manage : Individual Entity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Authority : Decision on implementation</li> <li>▪ Manage : Individual Contractor</li> </ul>



## What is your choice on PMS?

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