Leveraging early phase Systems practices

To explore Operational needs, capture all key Requirements

Anne O'Neil Consultants LLC

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

MTA Maryland

- Significant challenges for capital projects to elicit complete, accurate Requirements

- Propose early phase Systems practices to address these challenges

Why does this generate such an issue for capital projects?

- Missed or incomplete requirements equates to:
  - Missing needs, constraints
  - Missing operational context
  - Lacking system performance, functionality
  - Misalignment with staff resourcing / capability, funded maintenance strategy

Generates change orders, project delays, cost overruns

Challenges to eliciting complete, accurate Requirements

Missing key stakeholders

- Who are the stakeholders?

- Why is this no longer so obvious?

- Why do we miss stakeholders?

  - Who's responsible party?

  - Multi-disciplinary systems

Challenges to eliciting complete, accurate Requirements

Users articulating their needs, requirements

- Availability of operations stakeholders

- Lack familiarity with latest technology, functionality

- Difficult without exposure to new system

- Focus on solutions too early – versus understanding operational context and needs

Early phase Systems practices to address challenges

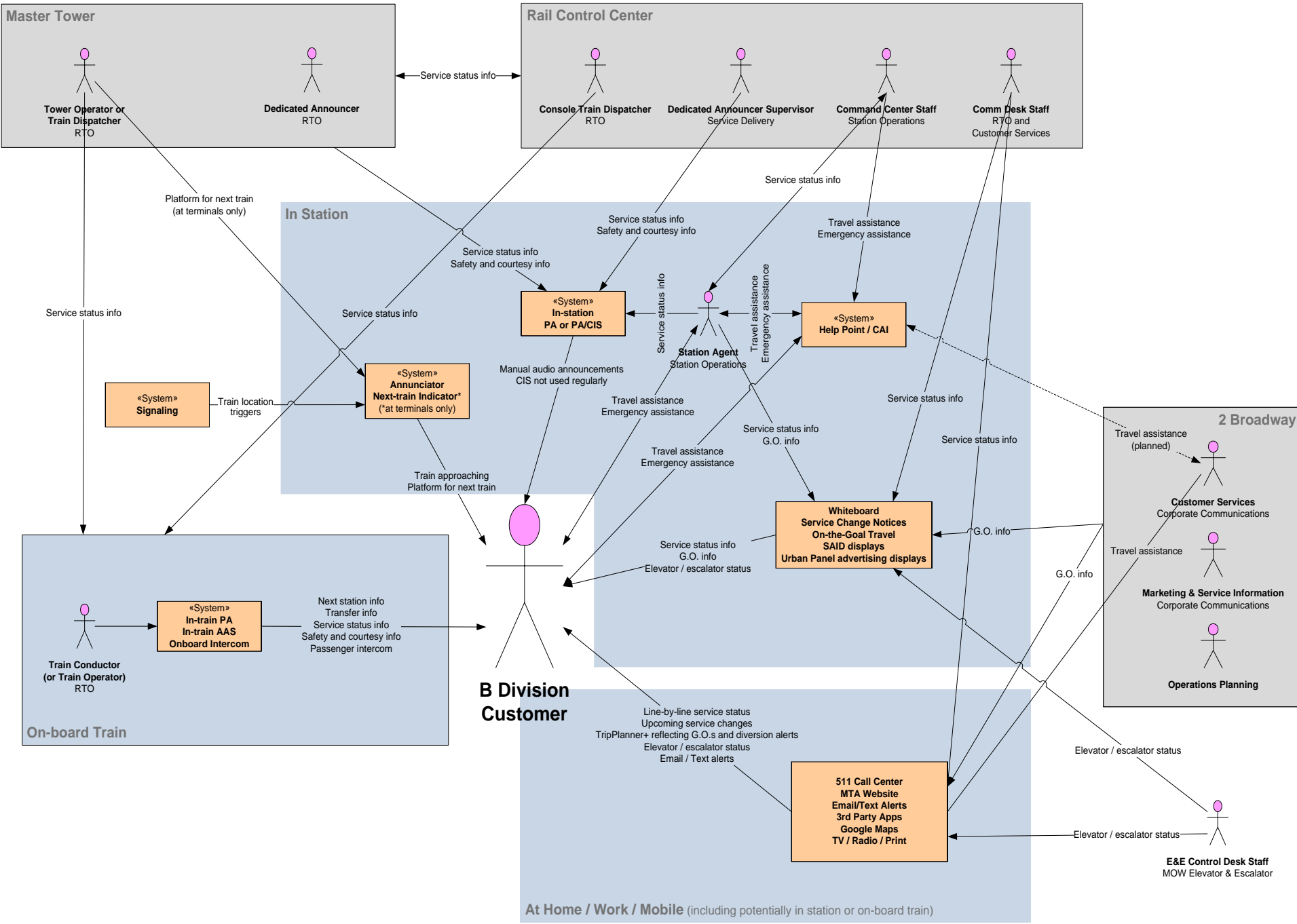## Stakeholder identification & analysis

- Holistic view of who is a stakeholder
- Analysis:
  - Who will be impacted by this project?
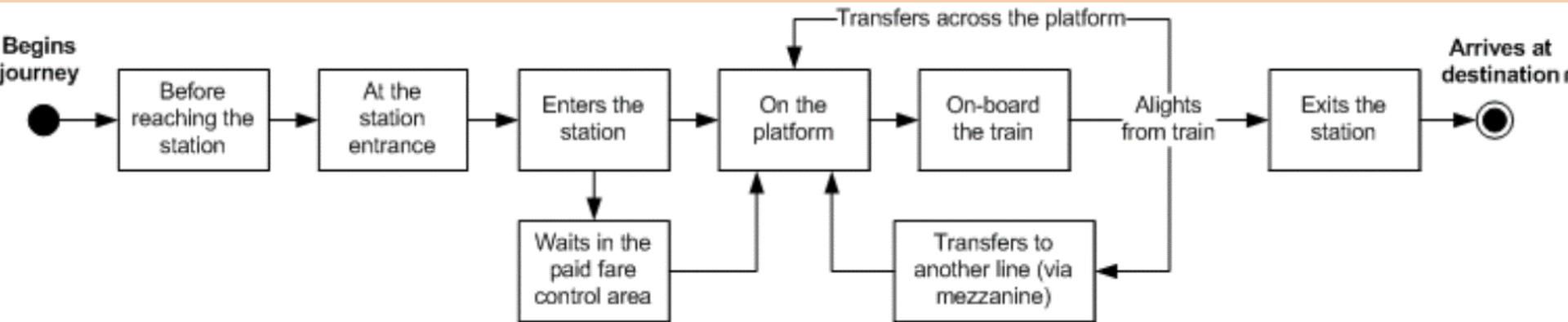 - Who may impact this project?

Iteratively reconsider whether missing stakeholders through project.   >> Start EARLY!

Customer Communications: stakeholders, tools and interfaces

Master Tower

Tower Operator or Train Dispatcher
RTO

Dedicated Announcer
RTO

Rail Control Center

← Service status info →

Console Train Dispatcher
RTO

Dedicated Announcer Supervisor
Service Delivery

Command Center Staff
Station Operations

Comm Desk Staff
RTO and Customer Services

In Station

Platform for next train
(at terminals only)

Service status info

Service status info
Safety and courtesy info

Service status info
Safety and courtesy info

Service status info

«System»
**In-station
PA or PA/CIS**

Service status info

Travel assistance
Emergency assistance

Travel assistance
Emergency assistance

«System»
Help Point / CAI

Station Agent
Station Operations

Manual audio announcements
CIS not used regularly

«System»
Signaling

Train location
triggers

«System»
**Annunciator
Next-train Indicator***
(*at terminals only)

Travel assistance
Emergency assistance

Travel assistance
Emergency assistance

Service status info
G.O. info

Service status info

Service status info

Train approaching
Platform for next train

2 Broadway

Travel assistance
(planned)

Customer Services
Corporate Communications

**Whiteboard
Service Change Notices
On-the-Goal Travel
SAID displays
Urban Panel advertising displays**

Service status info
G.O. info
Elevator / escalator status

G.O. info

Travel assistance

Marketing & Service Information
Corporate Communications

On-board Train

**Train Conductor
(or Train Operator)**
RTO

«System»
**In-train PA
In-train AAS
Onboard Intercom**

Next station info
Transfer info
Service status info
Safety and courtesy info
Passenger intercom

**B Division
Customer**

G.O. info

Operations Planning

At Home / Work / Mobile (including potentially in station or on-board train)

Line-by-line service status
Upcoming service changes
TripPlanner+ reflecting G.O.s and diversion alerts
Elevator / escalator status
Email / Text alerts

**511 Call Center
MTA Website
Email/Text Alerts
3rd Party Apps
Google Maps
TV / Radio / Print**

Elevator / escalator status

Elevator / escalator status

E&E Control Desk Staff
MOW Elevator & Escalator

Summary of Customer Journey – decision points

Early phase Systems practices to address challenges

Develop Concept of Operations –

Defining the operational context, primary needs, priorities, constraints

- Current "As Is" Operation, Future "To Be" Operation
- Operational Scenarios, across modes of operation
- Operational phasing & transition to new system

Early phase Systems practices to address challenges

SE techniques and practices:

- Systems facilitators conduct iterative series of workshops - iteratively document and validate

- Will typically start with "what users know"

- Employ techniques to expose latest available functionality relevant to needs and deployment context

  Facilitated process of discovery & documentation

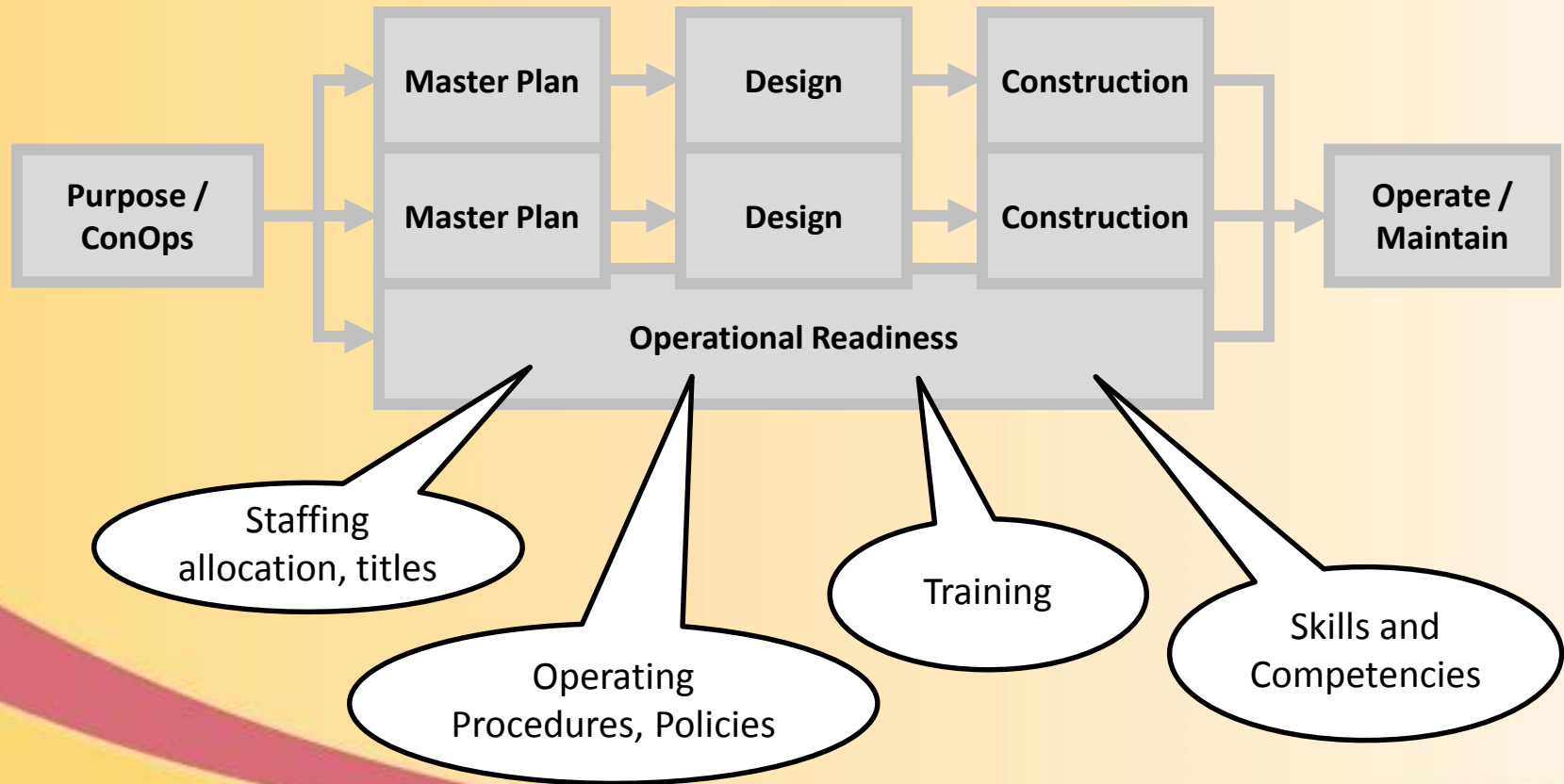# Early phase Systems practices to address challenges

Develop Concept of Maintenance –

Defining maintenance strategy for new system

- Maintenance needs, constraints;

- Analyze & identify RAMS performance targets

- Consider changes to: regimens; lowest replaceable units (LRU); skills needed – IT, comms networks, etc.

RAMS = Reliability, Maintainability, Safety / Security

Early phase Systems practices to address challenges

Purpose / ConOps → Master Plan → Design → Construction → Operate / Maintain

Master Plan → Design → Construction

Operational Readiness

- Staffing allocation, titles
- Operating Procedures, Policies
- Training
- Skills and Competencies

Prepare for Operational Readiness – leverage Organizational Change Management practices

Early phase Systems practices to address challenges

Key benefits:

- Ensure more complete, accurate requirements
- Provides requirements traceability
- Defines basis for operational acceptance
- Provides clarity to design team, development teams, test and commissioning teams.

- Particularly important for **Design/Build** projects:
  - Greater urgency for agency to articulate agreed upon operational expectations to D/B entity
  - Convey common set of expectations as basis for test & acceptance criteria
  - Purpose is speed … late adjustments injects delays

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