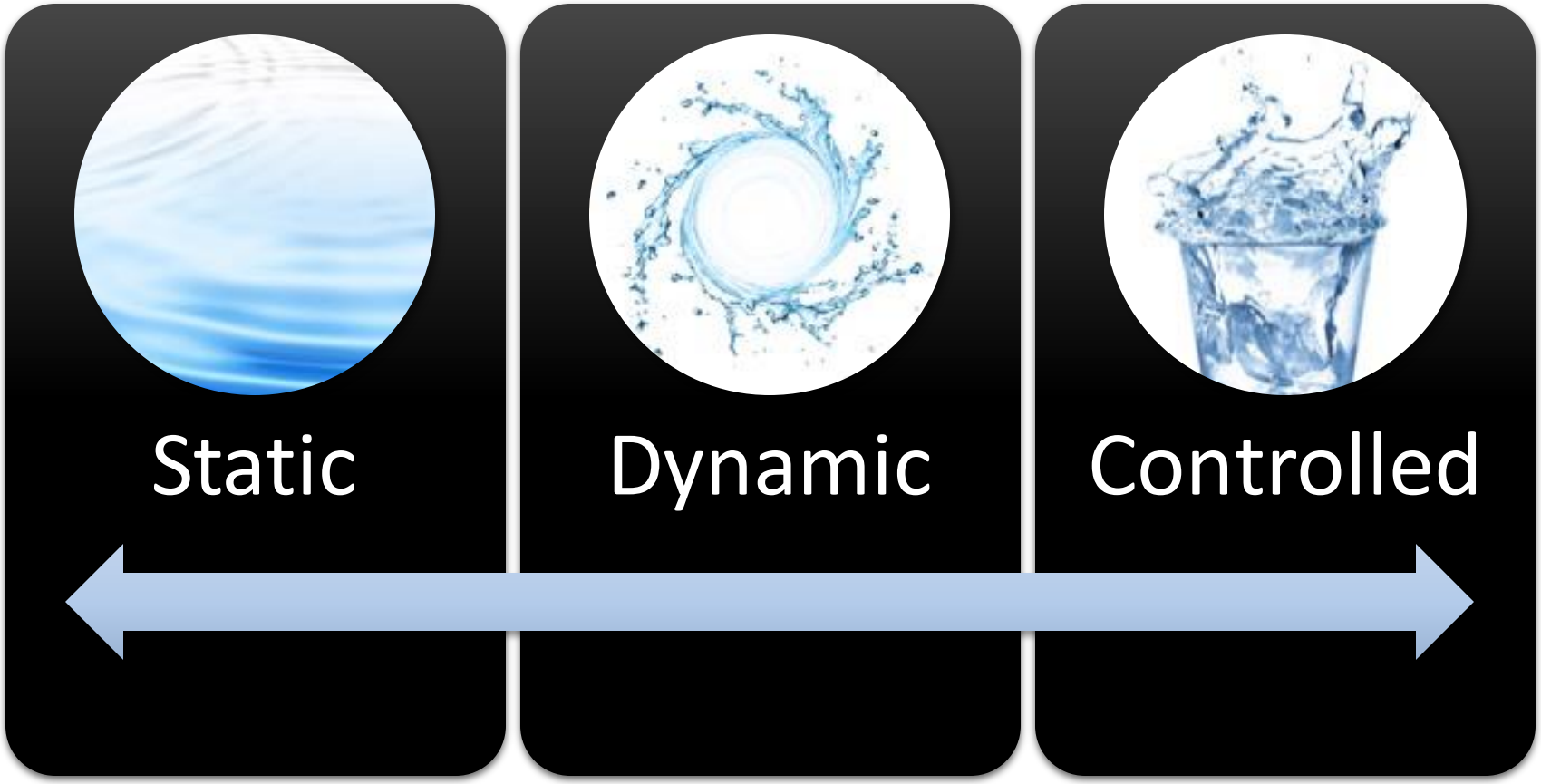
FirstNet Quality of Service Priority and Preemption Framework*

Brian Kassa
Director of Technology Planning and Development

* This is a conceptual QPP framework. The final QPP framework will be determined by FirstNet and its network partner.

Network Status

Three Network States



Covered Leasing Agreement Users

Three CLA User States

Free Range

Restricted

Preempted

Emergency/Non-Emergency User States

Immediate Peril

Responder Emergency

Relayed Users

Static User Data

Primary User Type

NPSTC U1

- Type of User: Discipline, Priority, Network Access, Network Admission, Scheduling Priority
- Source: Provisioned Data

User Default Role

NPSTC U3

- Default Leadership or Functional Role
- Source: Provisioned Data

Dynamic User Data

FirstNet®

User Location
NPSTC U4

- User Device Relative Location
- Source: Network

User Operational Status
NPSTC U5

- Assigned to an Incident identified by a Unique Incident Identifier or Not Assigned
- Source: API, CAD or App by Public Safety

Incident Role
NPSTC U9

- Incident Role for an Incident Identified by a Unique Incident Identifier or No Role
- Source: API, CAD or App by Public Safety

Dynamic Incident Data

FirstNet®

Incident Identifier

- Unique Incident Identifier used to tie users and incident together
- Source: Network Assigned

Incident Location

- Point Location or Geo-fence location for an Incident
- Source: API, CAD or App by Public Safety

Incident Severity

NPSTC U8

- The severity of an incident
- Source: API, CAD or App by Public Safety

Static Application Data:

Application Profile

NPSTC U2 | NPSTC U10

Type	• Major Application Type: Incident Command, Voice, Messaging, 911, Applications, Machine-to-Machine, Video, Responder Safety and Off-Net
Usage Scenario	• One of approximately 40 Predefined usage scenarios
Priority	• Priority Value for the application: High – Medium - Low
Quality	• Quality of Service (delay tolerance) for the Application: High - Medium - Low
Preemption	• Whether the Application can Preempt or be Preempted: Can Preempt - Can Be Preempted
Frequency of Use	• Expected frequency of use for the Application: Usage per Hour
Expected Bandwidth	• Expected or required bandwidth for the Application: in Kilobits per second

Source: At time of Agency onboarding to FirstNet, Agency accepts Default Values or configures their own agency specific data through local control.

Static Application Data:
Operational Profile – ~10 Profiles per Agency

Operational Profile 1: "In Station"

- Type - Usage Scenario A – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario B – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario C – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario D – Priority – Quality – Preemption – Frequency - Bandwidth

Operational Profile 2: "Single Family Structure Fire"

- Type - Usage Scenario A – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario E – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario R – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario T – Priority – Quality – Preemption – Frequency - Bandwidth

Operational Profile 10: "Wildland Fire"

- Type - Usage Scenario U – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario X – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario Y – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario Z – Priority – Quality – Preemption – Frequency - Bandwidth

Responder Emergency

- Type - Usage Scenario U – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario X – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario Y – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario Z – Priority – Quality – Preemption – Frequency - Bandwidth

Immediate Peril

- Type - Usage Scenario U – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario X – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario Y – Priority – Quality – Preemption – Frequency - Bandwidth
- Type - Usage Scenario Z – Priority – Quality – Preemption – Frequency - Bandwidth

Source: At time of Agency onboarding to FirstNet, Agency accepts Default Values or configures their own agency specific data through local control

Sample Operational Profile

Operational Profile 2:

"Single Family Structure Fire"

- Type: Application – **Computer Aided Dispatch** – Priority High – Preemption High – Quality Medium – Frequency 5XHour – BW 64Kbps
- Type: Application – **Paging/Alerting** – Priority High – Preemption High – Quality Medium – Frequency 5XHour – BW 64Kbps
- Type: Application – **Situational Awareness** – Priority High – Preemption High – Quality High – Frequency Continuous – BW 10 Kbps
- Type: Application – **Basic Internet** – Priority Low – Preemption Vulnerable – Quality Low – Frequency 5XHour – BW 128Kbps
- Type: Responder Safety – **Human Telemetry** – Priority High – Preemption Can – Quality High – Frequency Continuous – BW 4Kbps
- Type: Application – **Fire Related** – Priority High – Preemption Vulnerable – Quality Medium – Frequency 5XHour – BW 64Kbps

Dynamic Application Data:
Profile Selection - Set User X to Profile Y

Profile 1: In Station

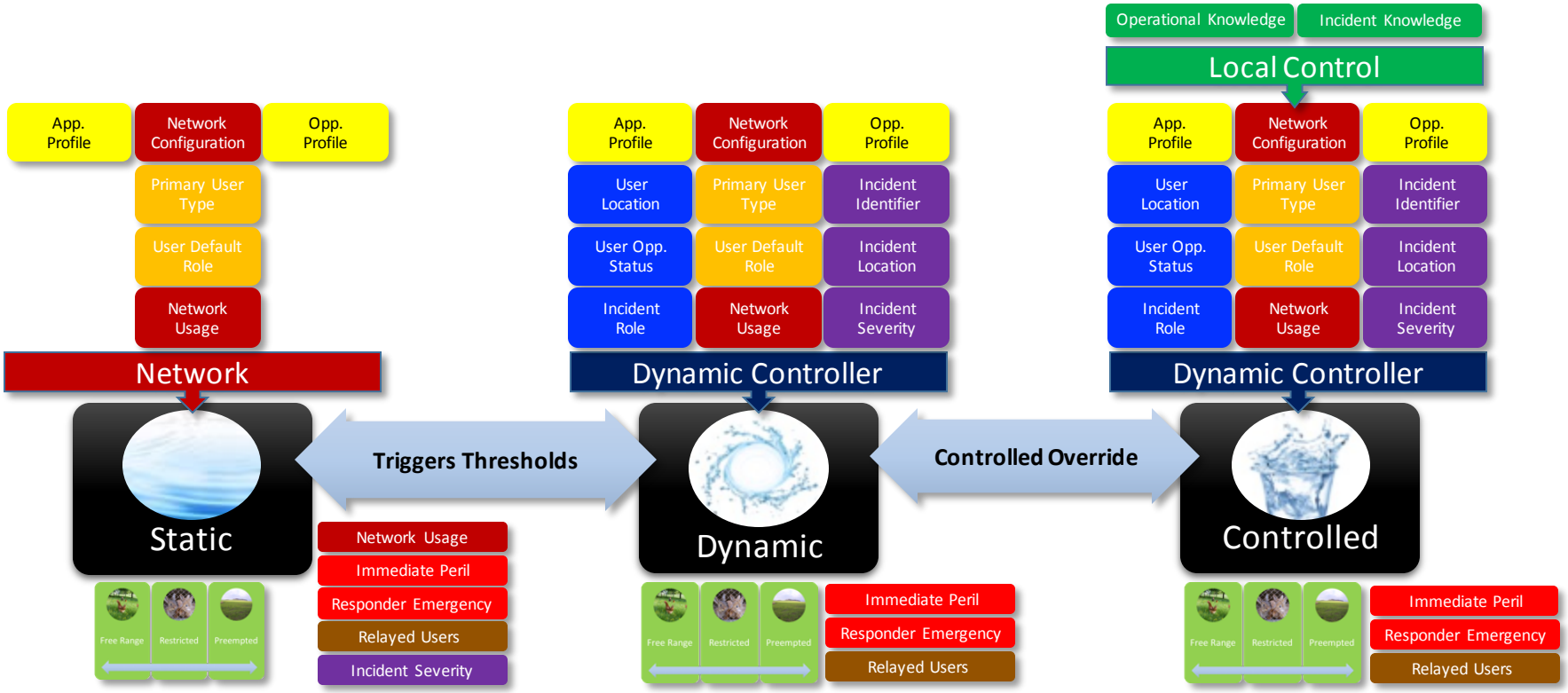
Profile 2: Single Family Structure Fire

Profile 5: Traffic Accident

Profile 10: Wildland Fire

Responder Emergency

Immediate Peril

Source: User default state is Profile 1. When user is assigned to an Incident through API, CAD or Application the users application profile can be set to another profile

QPP Framework