MOTOROLA SOLUTIONS

THE FUTURE OF COMMUNICATIONS IN MONTANA

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SCOPE OF PRESENTATION

- The State of the "State" System
- Large-Scale Options for Montana
- Land Mobile Radio Options for Montana
- Motorola's Analysis
- Work to Date & Commitment

MY BACKGROUND

MOTOROLA

Brad Steiner
Senior Account Executive
Strategic Projects

- Over 16 years at Motorola
- Engineer, Cellular Infrastructure (6 years)
  - RF Engineer
  - Market Performance Engineer
  - Nation-wide System Perf. & Planning
- Engineer, Public Safety (9 years)
  - Senior Staff Systems Engineer
  - Systems Engineering Manager (WA)
  - Systems Engineering Manager (NW)
- Account Manager (8 months)
  - King County/Puget Sound (WA)
- Account Executive (5 months)
  - WA, OR, ID, MT, AK, CA, HI
  - Strategic Projects Team
  - Long-term, building
  - Non-Traditional (i.e. beyond radio)

WHAT IS MY PURPOSE IN MONTANA?

- To assist Montana in determining its communication needs and help meet those needs to the best of my ability

- Engaged by the MHP to identify deficiencies in the current system
  - Technical and non-technical
  - Identify <u>all</u> possible solutions
  - Help create partnership opportunities through open dialog between agencies and identify areas where needs overlap

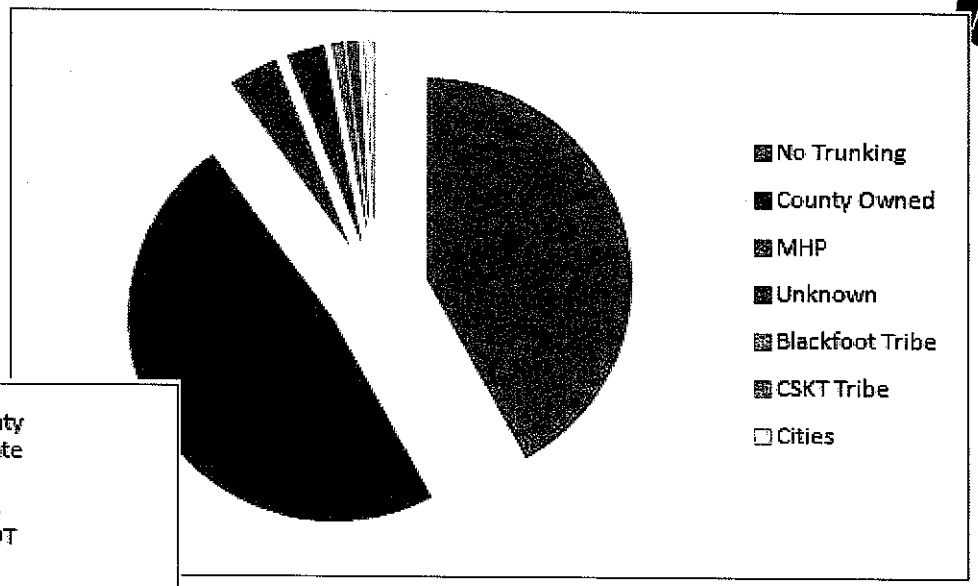
THE STATE OF THE SYSTEM

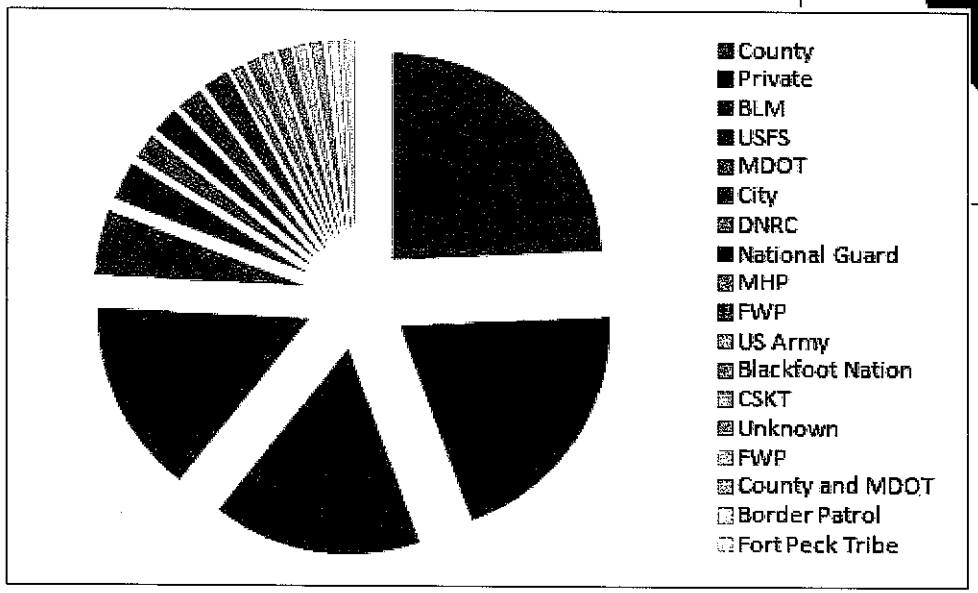
"THE STATE SYSTEM"

- A "State Managed System" does not exist
  - Everyone thinks that it does
- "It's not my problem"
  - Fact: many agencies are hosting State users on their equipment/systems, not the other way around

SYSTEM OWNERSHIP

- Trunking Hardware (Right)
- Land/Sites (Below)

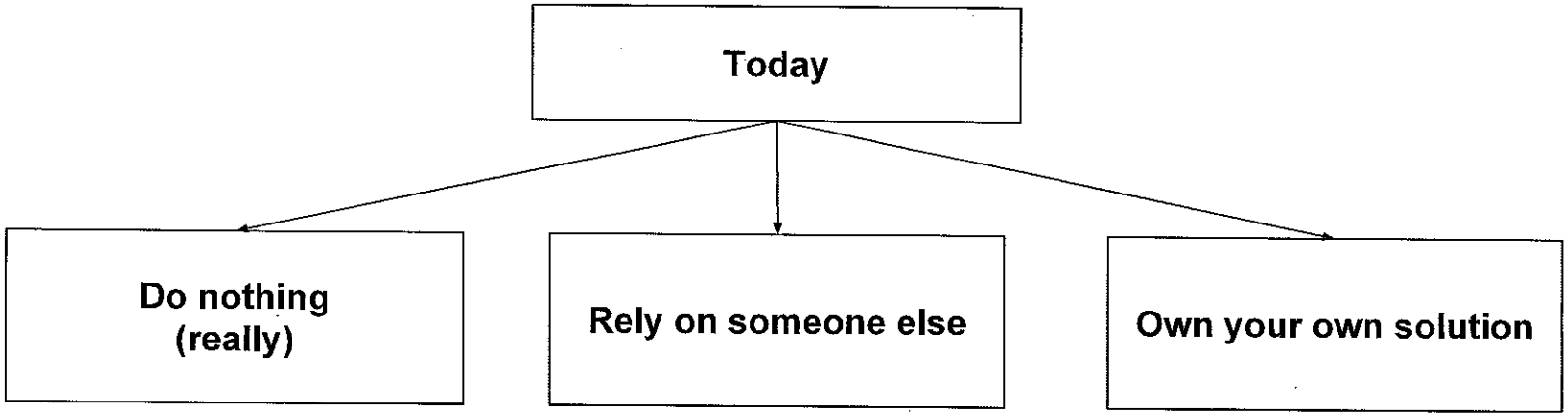




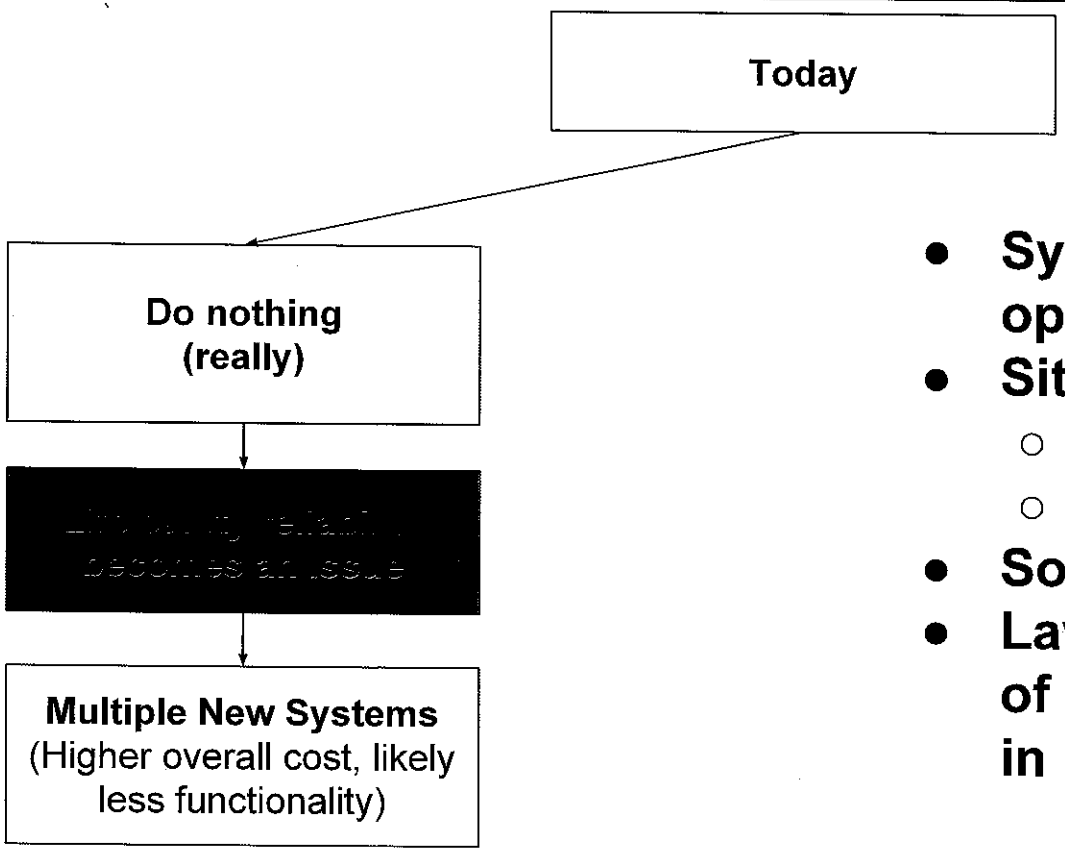
PRIMARY ISSUE IDENTIFIED

- There is not a cohesive group whose job it is to keep the system functioning and it's users satisfied
  - System expectations are not set therefore expectations can never be met
  - User education/outreach is non-existent
- What is the process for getting anything done?
  - Doing nothing diminishes performance over time
- Lives depend on this system

ONE OF THREE PATHS...



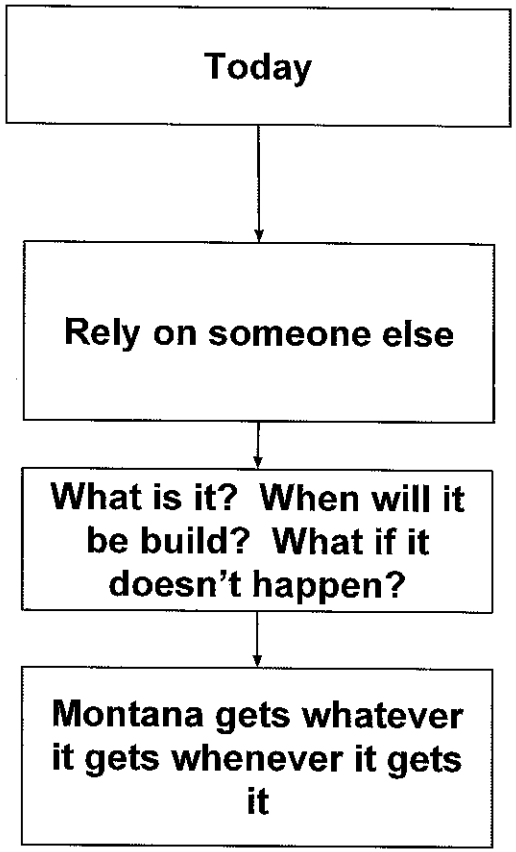
ONE OF THREE PATHS & THEIR RESULTS



- System will continue to operate
- Sites will go out of support
  - Higher failure rates
  - No one to fix them
- Someone will get hurt
- Lawsuits will get some type of communication system(s) in place

ONE OF THREE PATHS & THEIR RESULTS (cont.)

- A variant of the "do nothing"
  - We do nothing
  - Someone does something
- Are you less accountable?
- What does it cost?
- Is it sustainable?



- Do you have a say in the solution?
- Does it meet your needs?
- Can it be changed?
- Are you *the* voice, or one of many?
  - How many?

PAST FEDERAL SOLUTION: IWN

- A nationwide public safety network is not a new idea
  - Integrated Wireless Network (IWN, post 9/11)
    - General Dynamics (Prime), IBM, M/A-COM (Harris), Nortel, Motorola, and Verizon Wireless
    - APCO P25 voice, nationwide, dedicated to first responders
- Network was partially built, then funding was pulled
  - IWN was stopped and FirstNet was born (voice to data shift)
  - Systems in place are frozen, lacking in maintenance funds
- Could this happen to again?
  - No sustainment funding = no future

NEW FEDERAL SOLUTION: FirstNet

- Montana's FirstNet staff is about helping Montana
  - This meeting is sponsored by FirstNet
  - Montana's FirstNet staff have been a partner to this exercise
  - FirstNet supports LMR and its continued use today
- Motorola supports FirstNet
  - As does nearly every communications-related company
    - Competitors/Carriers (Verizon/AT&T)
    - Microwave/Telco
    - Tower, facility providers
  - All will benefit, if it happens
- ***FirstNet viability is not a question of technology, but of economics***

FirstNet VIABILITY

- All systems require stable funding to be successful
  - Appropriations/Grants (secure/recurring)
  - Taxes
  - Fees/Charges

- FirstNet is courting partners who will be accountable for building and <u>sustaining</u> the network

- FirstNet does not have a sustainability plan/commitment yet
  - Idea = "This is how it could work"
  - Plan = "This is how it will work"
  - Commitment = "This is how we will guarantee it will work"

FirstNet INFORMATION SOURCES

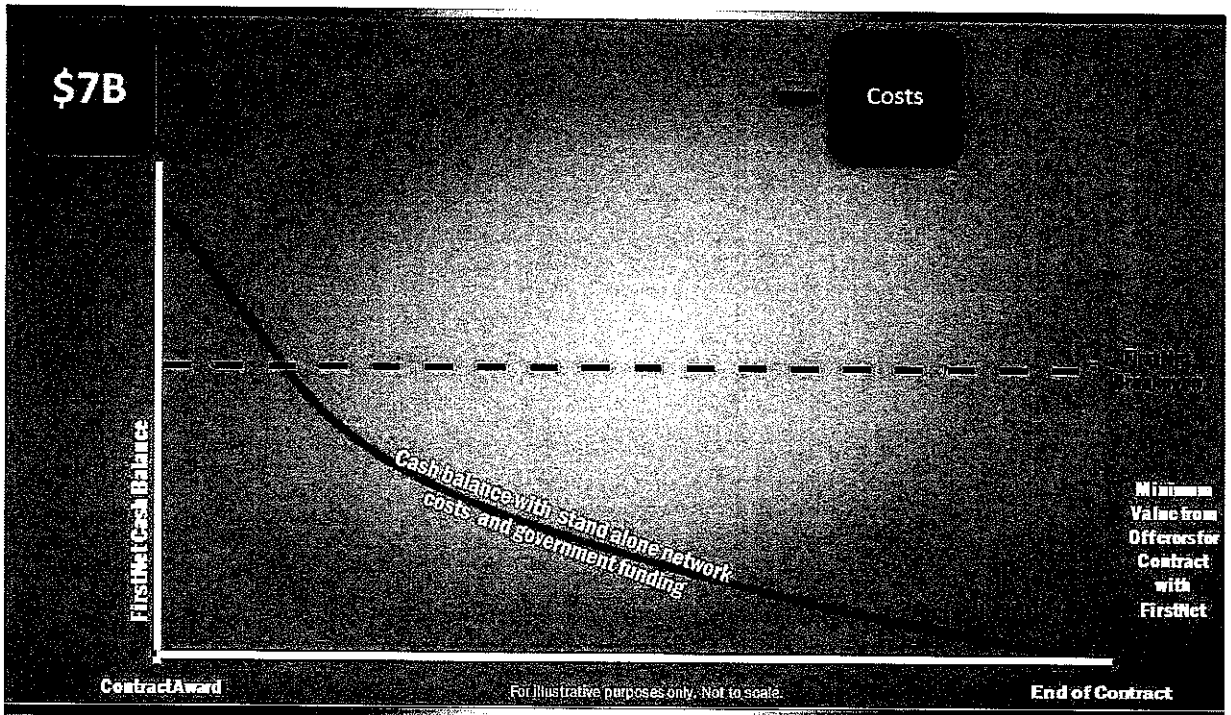
- The following material is public information and is available to all via the FirstNet web-site (which is excellent)
  - www.firstnet.gov

FirstNet's Equation for Financial Sustainability

$7B + Fees + Synergies + Excess Network Capacity − Costs = Financial Sustainability

FirstNet MATERIAL (cont.)

The FirstNet Opportunity



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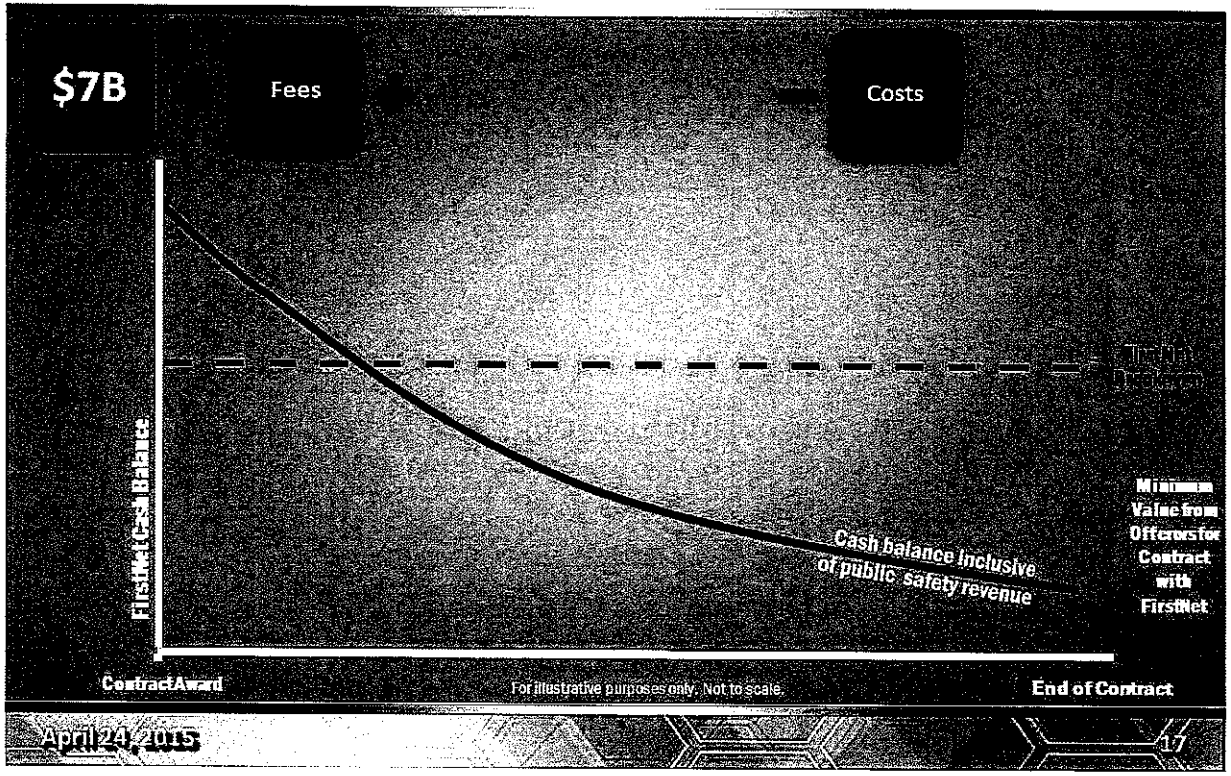

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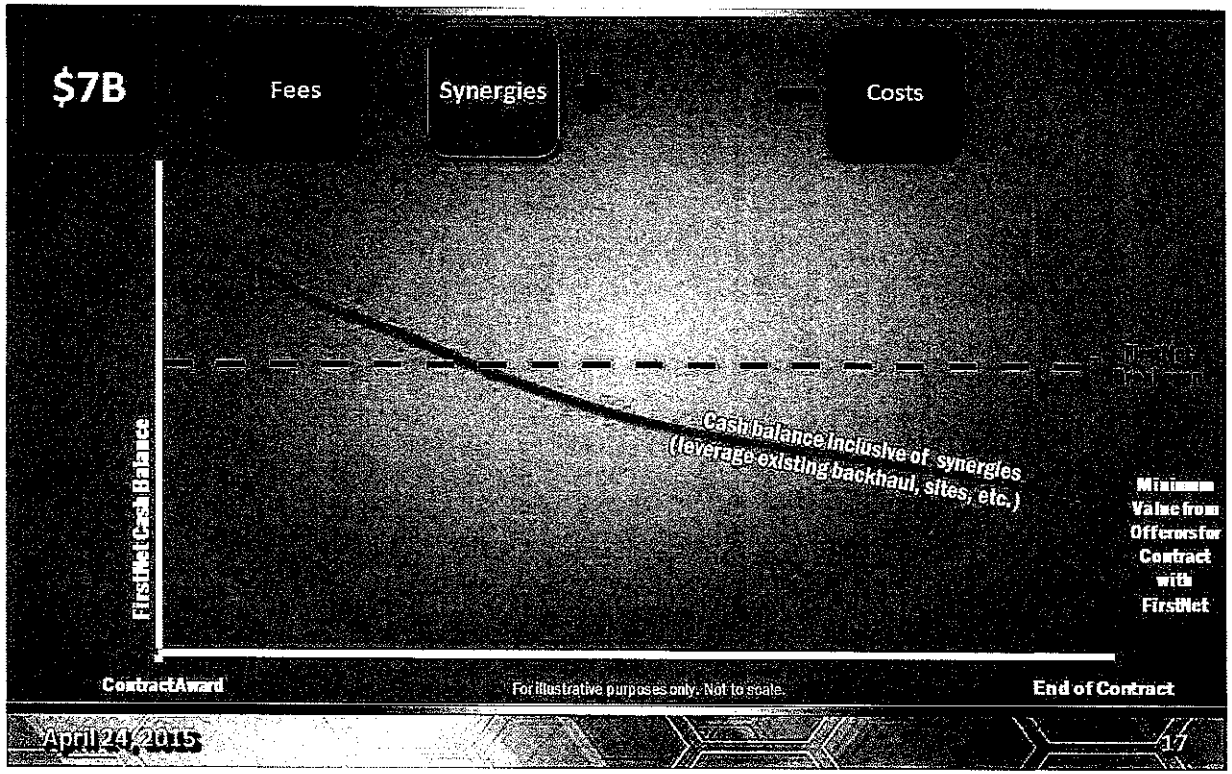

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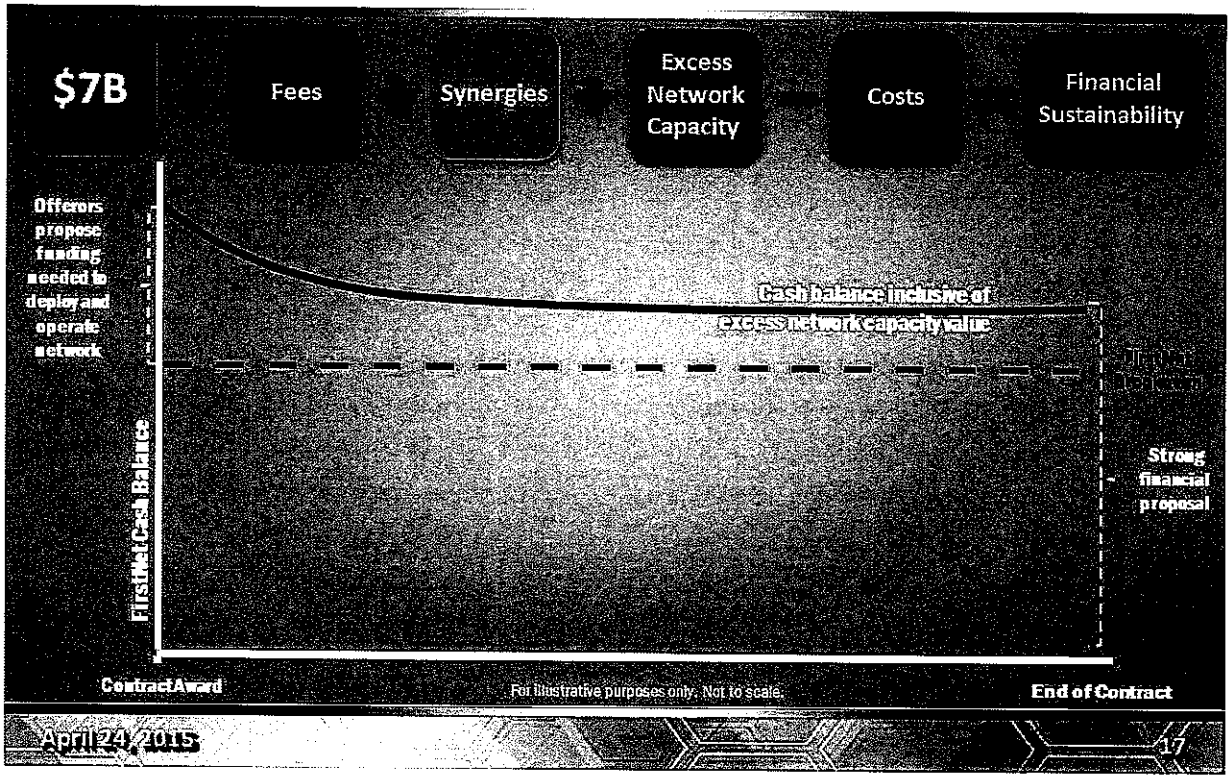


FirstNet GUIDING PRINCIPLES

1. **FirstNet will be a public safety-grade network built to meet the needs of our nation's first responders**
2. **FirstNet will provide public safety users with true priority access to the network**
3. **FirstNet will harden the network to assist with resiliency during natural disasters, incidents and man-made threats**
4. **FirstNet will enhance public safety communications by delivering mission-critical data and applications that augment the voice capabilities of today's land mobile radio (LMR) networks**
5. **FirstNet will enable local communications management and keep incident commanders in control**
6. FirstNet will be judicious with taxpayer dollars while remaining focused on offering its services to public safety at a compelling cost
7. FirstNet will have effective security controls that protect data and defend against Cyber Threats
8. FirstNet will design a backhaul approach that keeps the network up and running
9. **FirstNet will leverage existing infrastructure where it makes economic and engineering sense**
10. FirstNet will support and learn from its BTOP project partners

FirstNet GUIDING PRINCIPLES SUMMARY

- To summarize, the network will...
  - Be "Public-Safety Grade"
    - Better coverage
    - Better resiliency
    - Prioritize a select group of users
  - Be more expensive than a traditional carrier network

FirstNet SUCCESS

- FirstNet will be successful (i.e. sustained) if a Federally-run program can assist a commercial partner in…
  - Building a better network than Verizon & AT&T
  - Out-compete Verizon & AT&T to lure enough consumers to it
    - Marketing, customer service, store-fronts?
    - Will users accept that they are "second tier" when it matters most?
    - Will users potentially pay more for service as public-safety will pay less on a more expensive network?
  - Continue to innovate and adapt to remain competitive

- Carriers already realized that it is not in their business model (maximize profitability) to host FirstNet users on their network
  - D-Block spectrum auction, prior to FirstNet creation

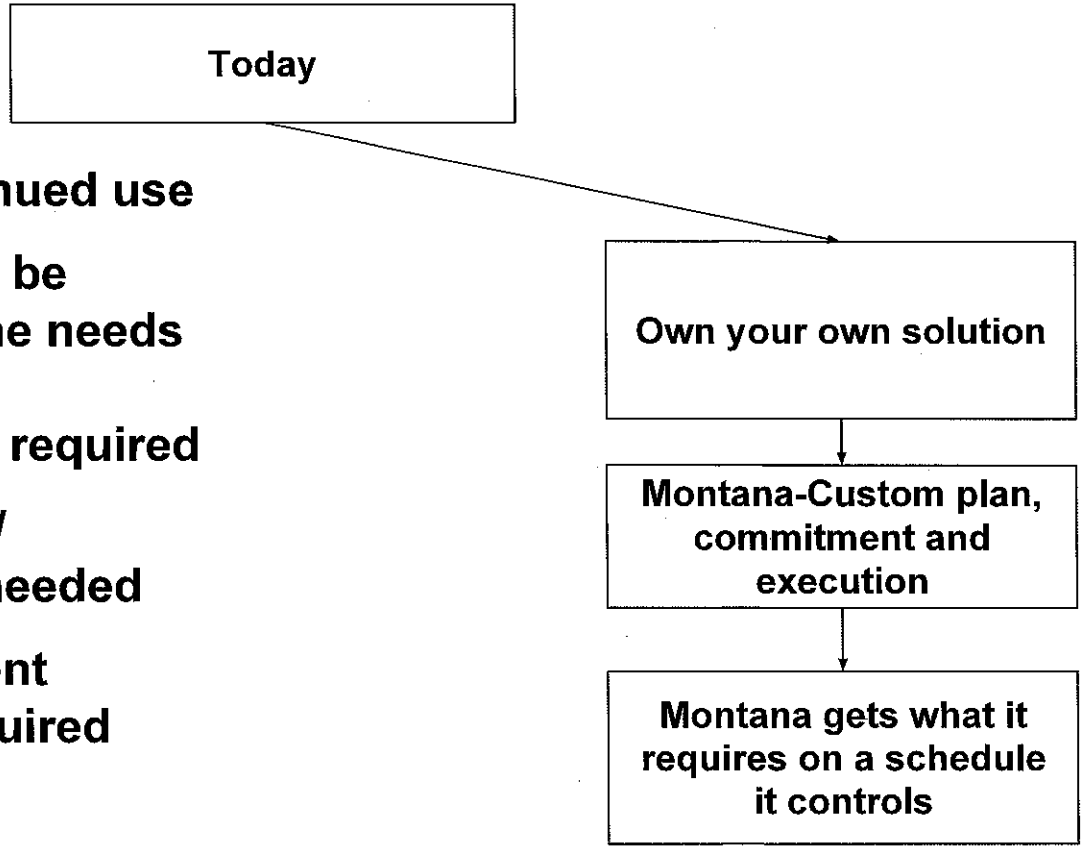
FirstNet AS MONTANA'S SOLUTION?

- FirstNet is not a practical solution to the current and pressing issues
  - FirstNet has no commitment for "mission critical" voice services
    - Their message is to not abandon LMR
  - FirstNet has a daunting business challenge ahead of them before the first hardware is purchased
  - Montana relying on FirstNet, who is in turn relying on their future partner to make it work?

- FirstNet could be a solution later
  - Recognize a idea vs. a plan vs. a commitment to execute
    - "opportunity, intends, serviceable, could, may, potential"

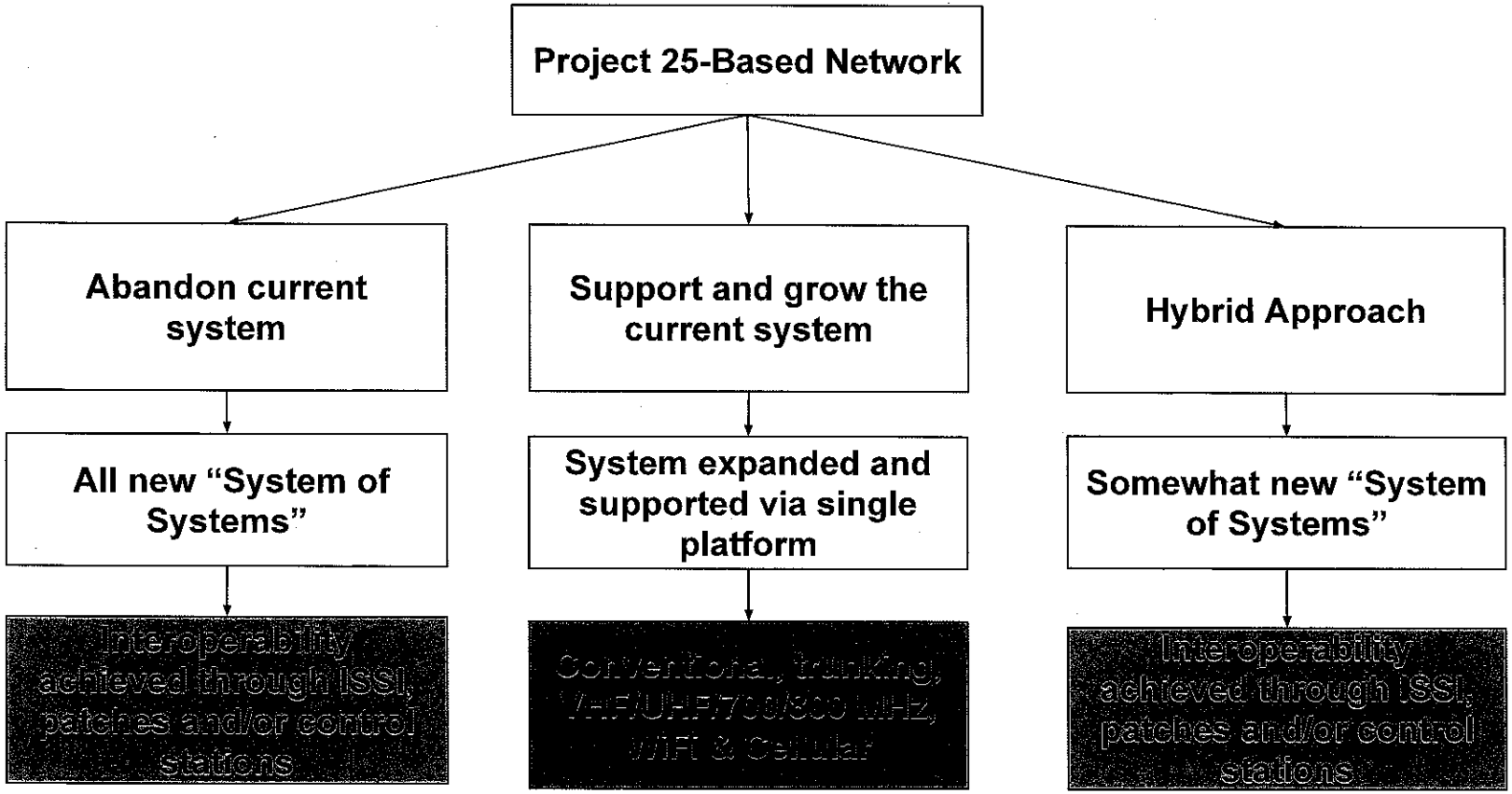
ONE OF THREE PATHS & THEIR RESULTS (cont.)

- LMR selected for continued use
- System approach <u>must</u> be reconfigured to meet the needs of Montana
  - Technical changes required
  - Long-term funding/ sustainment plan needed
  - System management organization is required



LAND MOBILE RADIO OPTIONS

TAKING ACTION MEANS OPTIONS



ABANDON/HYBRID SYSTEM APPROACH

Project 25-Based Network

Abandon current system

All new "System of Systems"

Interoperability achieved through ISSI, patches and/or control stations

- New/multiple procurements
- Carries forward and creates more communication issues between agencies
- *Less functionality than today*
- Introduces multiple vendors to any discussion/conflict

Hybrid Approach

Somewhat new "System of Systems"

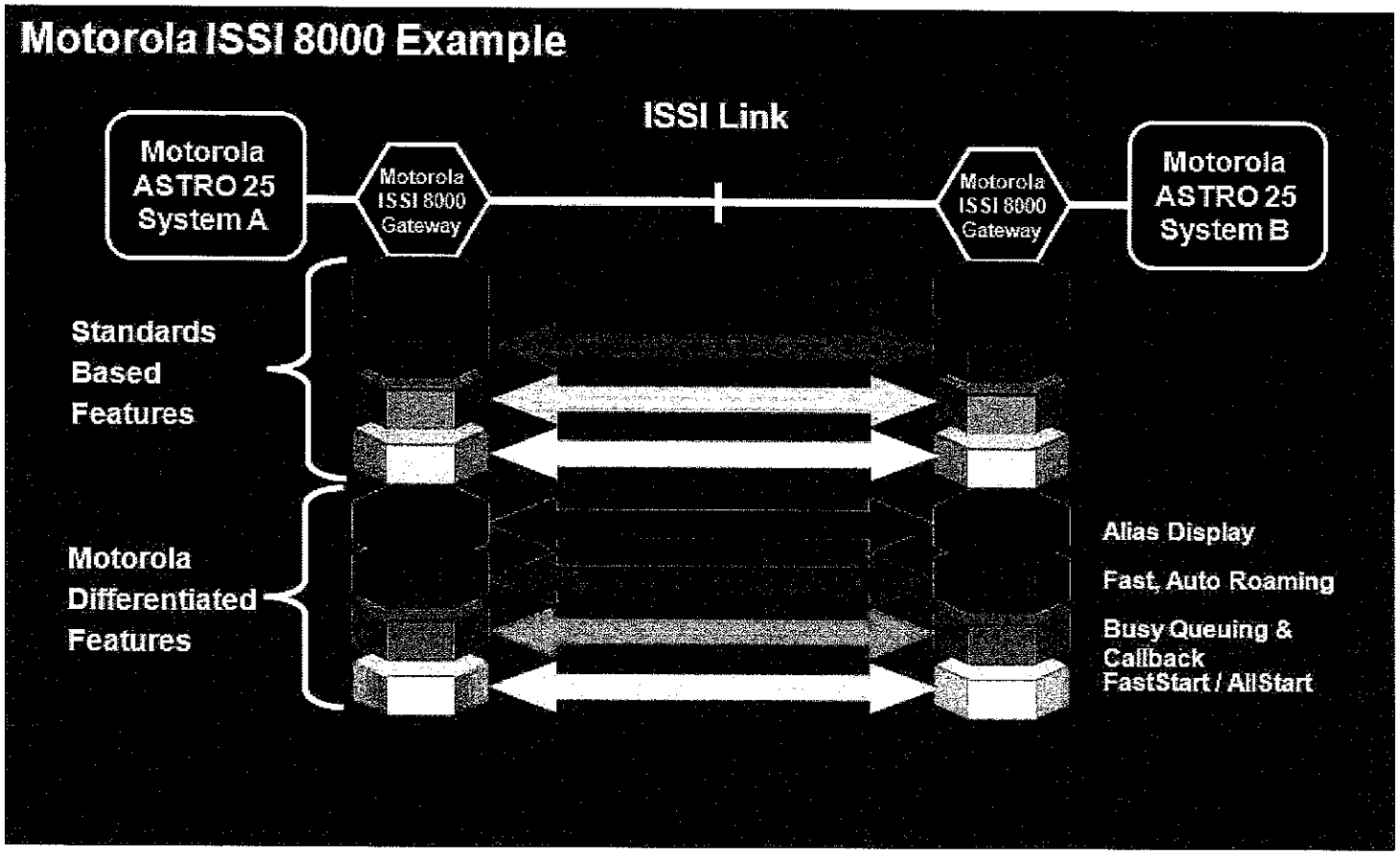
Interoperability achieved through ISSI, patches and/or control stations

BRAVE NEW WORLD

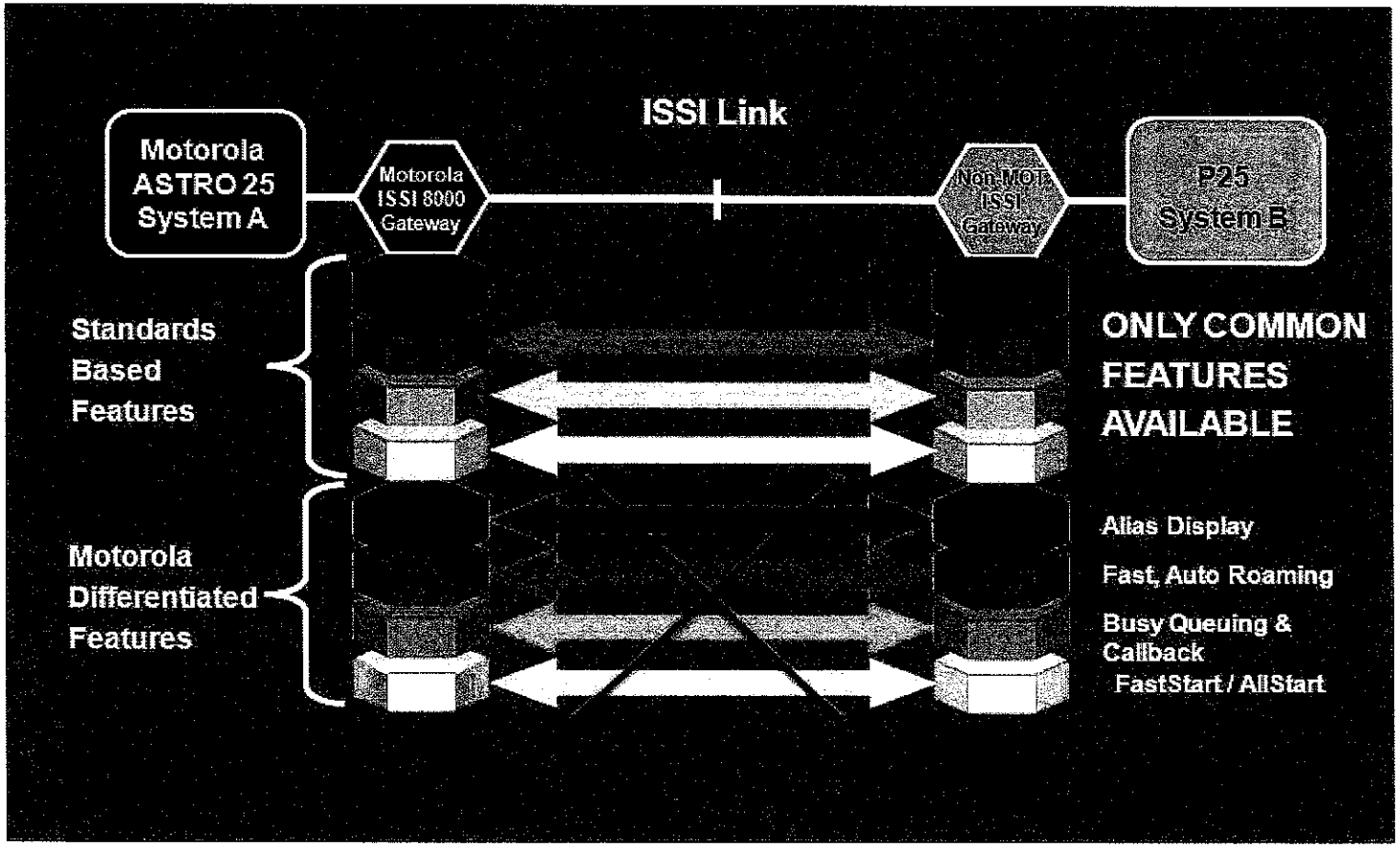
- Since the last procurement, the P25 world has changed

- P25 ISSI (Inter RF Subsystem Interface)
  - Specifically designed to bridge systems of different vendors
    - Systems, not sites or consoles
    - Voice & Trunking only per standard
    - Automatic or manual system switching
  - Increase in functionality from patch/control station
    - Patch/Control Station provides primarily audio
  - Standards based
    - Double-edged sword
  - Now a part of every system Motorola sells

MOTOROLA ISSI



MIXED VENDOR ISSI

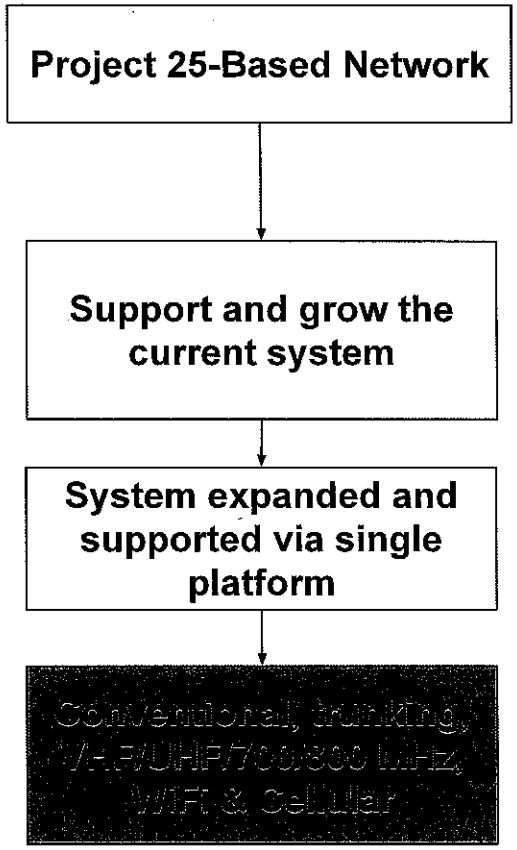


MULTIPLE VENDOR OPTIONS

- P25 Technology now allows the use across the state of
  - Multiple system types (Motorola, Harris, Tait, etc.)
  - Multiple subscriber types
    - Motorola, Harris, Tait, Kenwood, etc.

- Practical Deployment Experience
  - Multi-Vendor system = Rare
    - Only at the Federal level
  - Multi-Vendor subscriber approach = Common
    - Vast majority of subscribers are from a single vendor however
  - *Contracting for an outcome, not hardware*
    - *"One throat to choke"*

SUPPORT AND GROW APPROACH

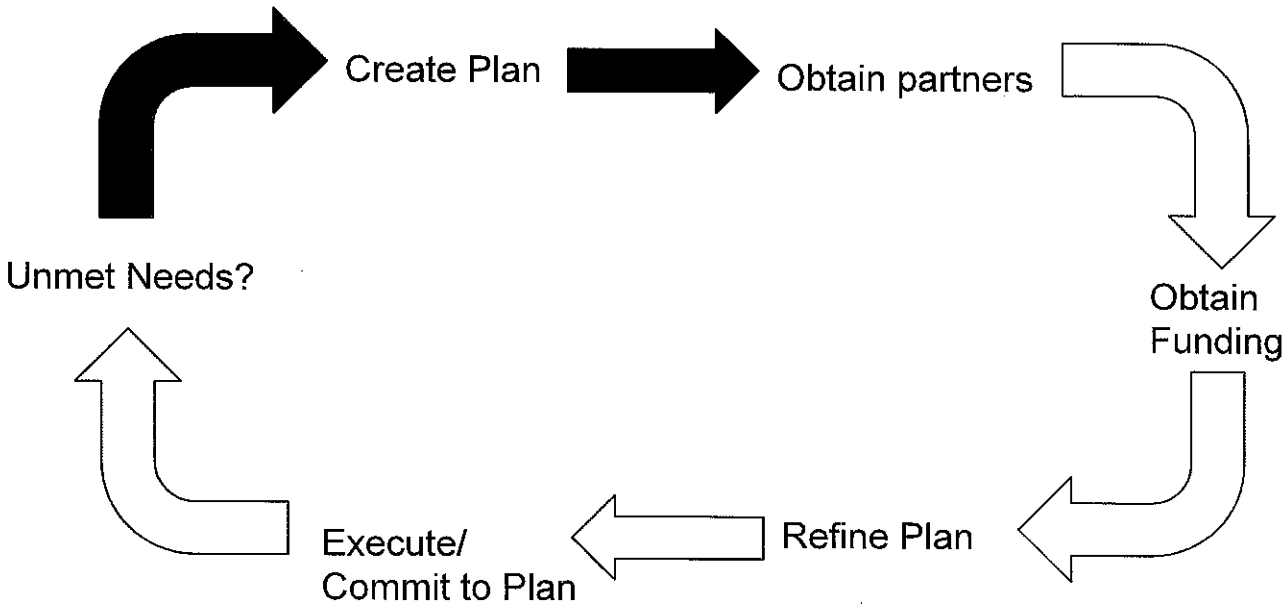


MOTOROLA'S ANALYSIS

WHAT I LEARNED...

- The system as it exists today is not the model to continue
  - One technology does not fit all
    - Conventional/Trunking
    - VHF/UHF/700/800 MHz
    - LMR/Broadband PTT
  - System management needs to be created
  - User satisfaction needs to be prioritized
  - Stable funding must be identified and secured

SUPPORT AND GROW PROCESS

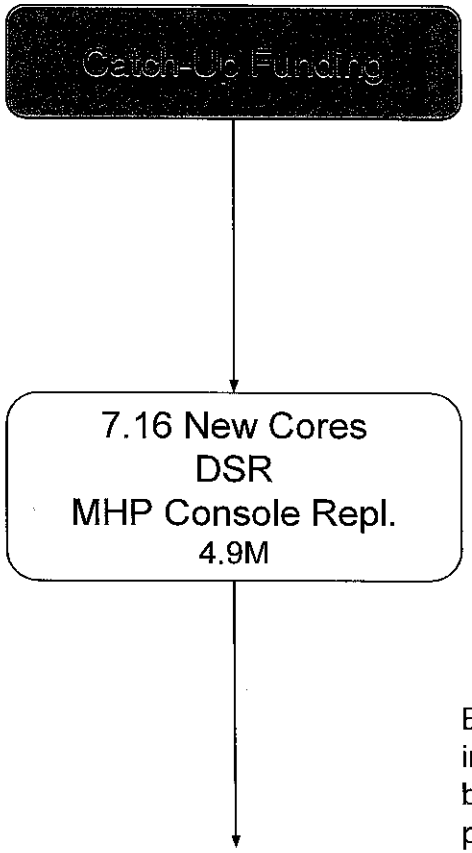


TECHNICAL PLAN

- Presented as a simple flow chart
- Projects and scope created based on meetings with key stakeholders (so far)
  - MHP
  - MDT
  - Gallatin County
  - Lewis & Clark County
  - Flathead County
- A model of things to come...

CATCH-UP PHASE: GET CURRENT

- **The Catch-Up phase will**
  - **Upgrade the entire system to a more current release**
  - **Upgrade the MHP dispatch consoles to the latest revision**
    - **Required to upgrade the system**
  - **Convert the system to one that supports Dynamic System Resilience**
    - **Network cores will be redundant for each-other**
    - **Eliminates the single point of failure for the Motorola voice equipment at the network core(s)**
  - **Add Motorola services to help maintain the system and provide for component repair and monitoring**

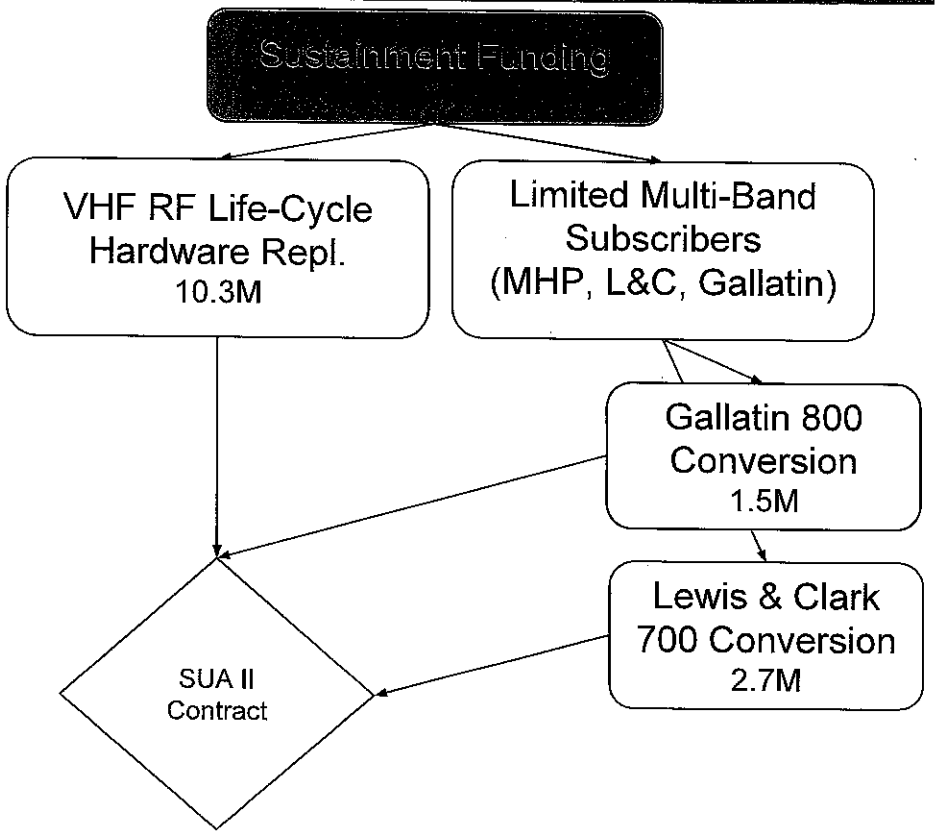


Motorola Services:
Dispatch Service
Network Monitoring
Security Monitoring
Security Update Svc.
Inf. Repair
(w/ Adv. Repl.)
Network Prev. Maint.

Budgetary pricing in presentation based on NASPO participation

SUSTAINMENT PHASE: LONG-TERM SUPPORT

- **The Sustainment phase will**
  - **Replace equipment that is currently scheduled to be out of support**
  - **Convert/Expand areas of the system to different bands for better performance**
  - **Create a System Upgrade Agreement <u>contract</u> so that the system will have a fixed/known cost to maintain and keep current**
    - **10 year contract envisioned, but can be reduced or expanded**



EXPANSION PHASE: ADDRESS WANTS

- **The expansion phase <u>can</u>**
  - **Add RF sites to the network**
  - **Increase user access and management capabilities for counties/agencies that desire it**
  - **Replace subscribers as necessary**

NM/POP 25 Clients
92k/85k

VHF Site Expansions

Facility Maintenance
2-3M PY

Subscribers (Life-Cycle)

TECHNICAL PLAN SUMMARY

- **The work summarized here will provide a stable foundation for Montana to utilize its existing LMR system for the next decade**
- **It can be priced at a fixed cost over multiple years and/or can be reviewed based on FirstNet deployment**

Phase	Budgetary Cost
Catch-Up	4.9M
Sustainment	14.5M
System Upgrade Agreement	750k per year

SUA includes system software every two years as well as any necessary hardware upgrades over a 10 year period
Network infrastructure only

"THE STATE SYSTEM"

OTHER STATE MANAGEMENT MODELS

State	Technology	System Model	Band(s)
North Dakota (planned)	LMR (P25)	Single System	VHF/800
Montana	LMR (P25)	Single System	VHF
Wyoming	LMR (P25)	Single System	VHF
Idaho	LMR (P25)	Single System (technical) System of Systems (management)	700
Oregon	LMR (P25)	Single System (State) System of Systems (locals)	VHF/UHF/800
Washington	LMR (P25)	System of Systems	VHF/700/800
Alaska	LMR (P25)	Single System	VHF

OTHER STATE FUNDING MODELS

State	Funding Sources
North Dakota (planned)	Targeting 911 fees and DOT funds
Montana	Federal & State grants
Wyoming	State general fund (grants), transportation funds, federal grants
Idaho	Funding varies by county (i.e. sub-systems funded individually)
Oregon	state general funds
Washington	State general funds, counties fund themselves
Alaska	Federal & state grants

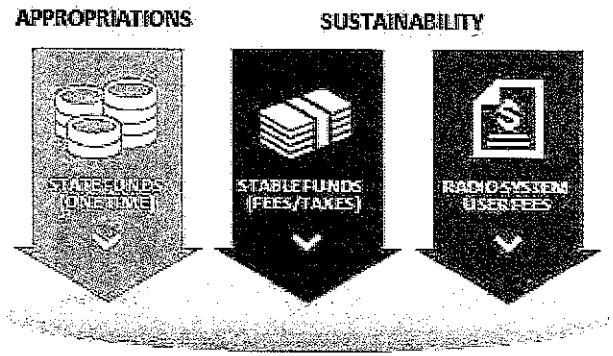
FUNDING SUMMARY

- It is the rare exception that a state system was funded with stable funds, yet it is the way systems should be planned
  - Minnesota
    - $0.03 on 9-1-1 fee
    - Highway bonds and fees
- Most State systems were built like Montana
  - Heavy infusion of "one time" funds
  - Idea that radio systems are a one-time purchase
  - No maintenance considerations
  - No system management costs

MONTANA MUST...

- Create accountability for system performance and management
- Create feedback mechanisms to address user issues and needs
- Create a stable funding stream
- Show value to both the legislature (return on investment) and the user's (performance)
- Demonstrate a genuine desire to “get it done”
  - It can start here, today

PROPOSED MANAGEMENT MODEL



AGENCY CHARTERED WITH STATE WIDE RADIO SYSTEM

Counties like Lewis & Clark, Butte-Silverbow, Gallatin & Yellowstone along with all others will receive support.

FINANCIAL SUPPORT

SERVICE SUPPORT

FINANCIAL & SERVICE SUPPORT

AGENCY MUST:

- Contract for Entire System
- Upgrade /Maintenence
- Provide a Service for Others
  - System/Requirements Management
  - Outsourcing of services
  - Engineering
  - Response Technicians

CONTRACT MANAGEMENT

- Control Quality of System
- Service Level Agreements with customer agencies
  - Availability
  - Response Times
  - Design Standards
  - Coverage /Audio
  - V/U/7/8 Best Practices
  - Coverage Testing

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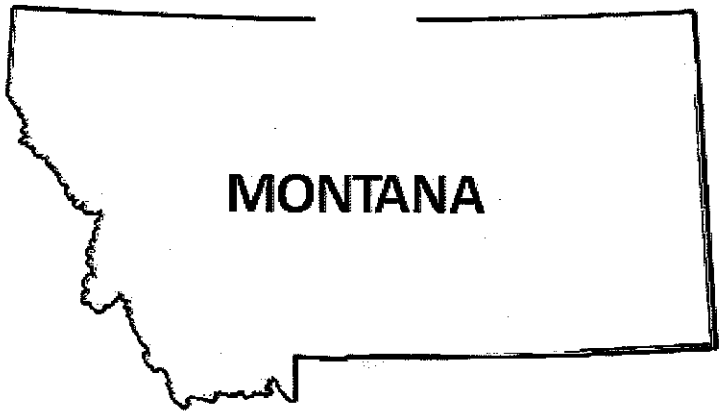
FINANCIAL SUPPORT

SERVICE SUPPORT

FINANCIAL & SERVICE SUPPORT



USER MEASURED PERFORMANCE

- User Feedback / Reporting
- Satisfaction = Value

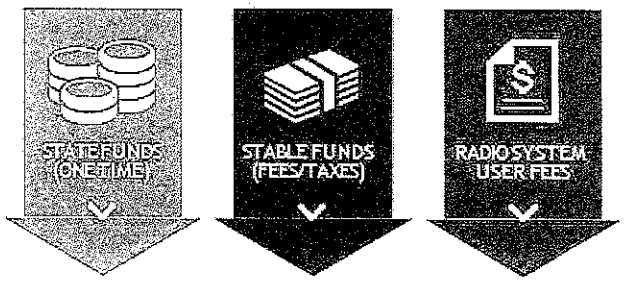
ISSUES ADDRESSED BY:

- State-Wide Agency (When Service Support Provided)
- County / Local (When Finanacial Support Provided)

MONTANA FUNDING SOURCES

APPROPRIATIONS

SUSTAINABILITY

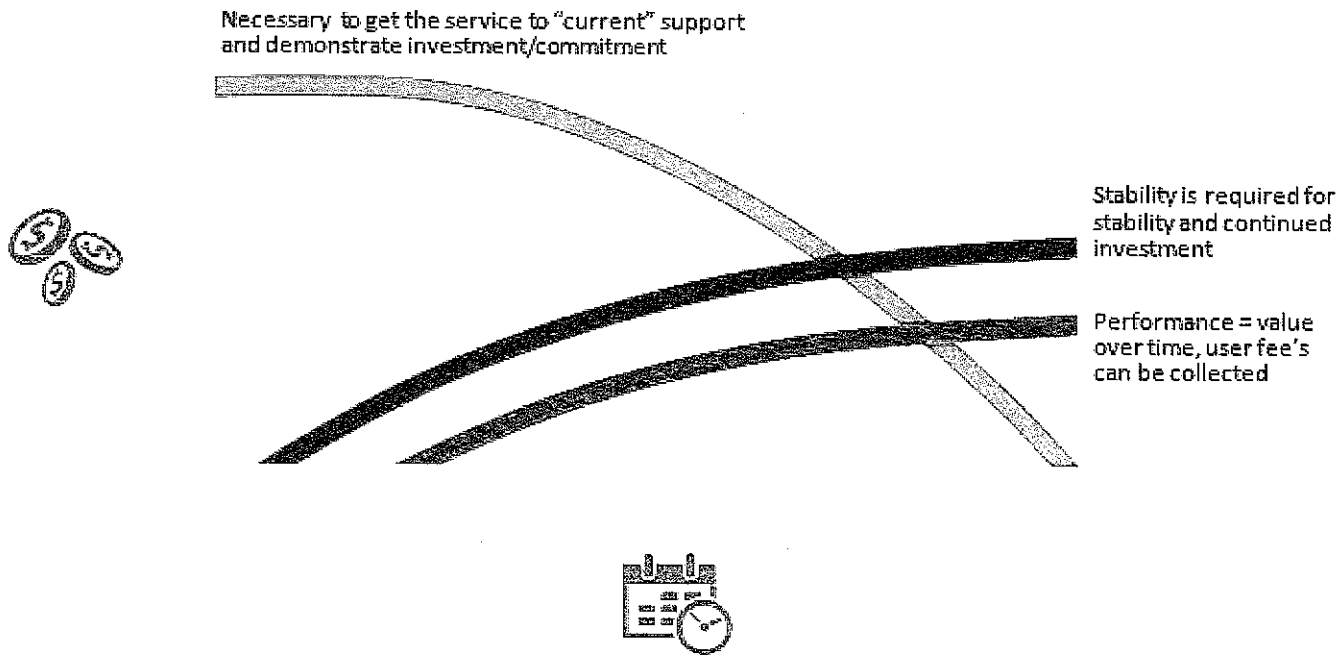


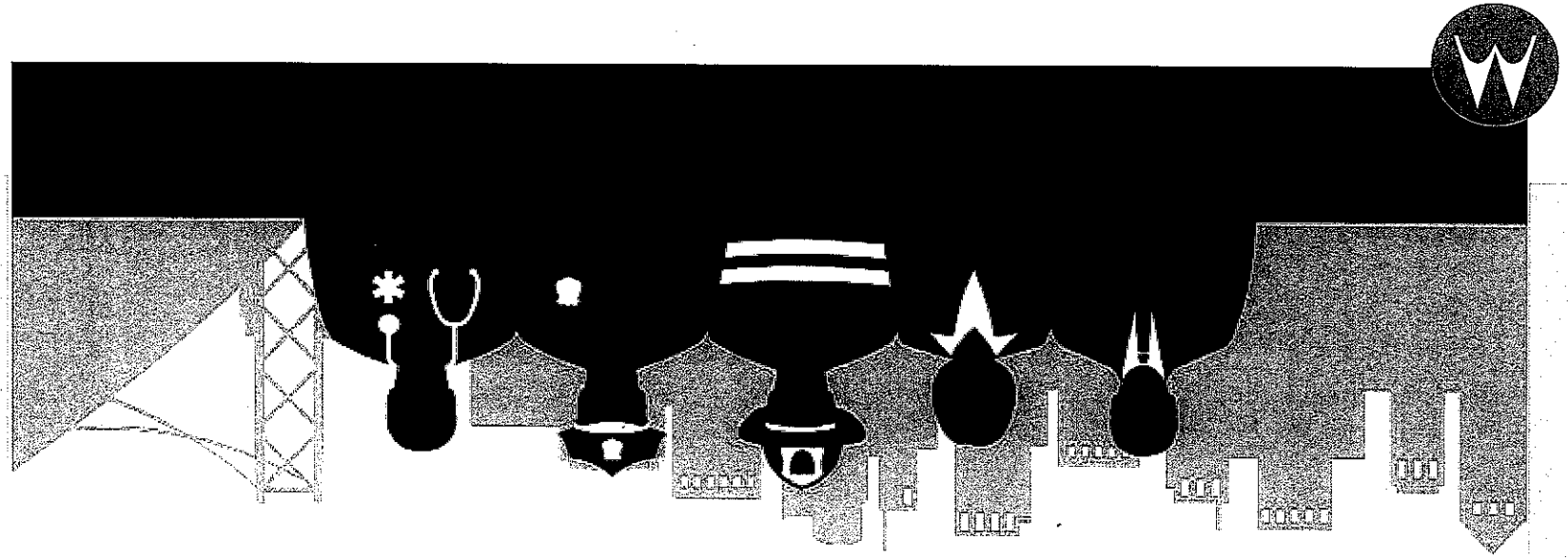
AGENCY CHARTERED WITH STATE WIDE RADIO SYSTEM

SYSTEM "TODOS"

CATCH-UP | SUSTAINABILITY | EXPANSION

MONTANA FUNDING SOURCES





BOOTS ON THE GROUND

- Motorola has been engaged in Montana heavily for the past 7 months
  - Meeting with various agencies and stakeholders
    - Understand system deficiencies
    - Demonstrate how issues can be fixed
    - Understand the needs of Montana
- Researching funding and other state plans

- We are here to earn your trust and business

GALLATIN COUNTY

- Motorola first met with representatives from Gallatin County 9-1-1 in January.
  - Learned that the existing "State System" did not perform to expectations, and that it wasn't even used
- Motorola proposed a Proof of Coverage demonstration
  - Prove that a well designed and managed project yields solid results
    - Contract for outcomes, not hardware
- Motorola provided 800 MHz site hardware, subscriber equipment, and installation/engineering services at no cost in a matter of weeks
- Other Montana partner agencies contributed time and effort
  - Lewis & Clark County, MHP, etc.

GALLATIN COUNTY RESULTS (TO DATE)

- Testing will be completed today, but coverage and performance of the single site is beyond expectations
- Portable in-building coverage is achieved in targeted Bozeman area with a single site - which no one thought possible
  - PD may switch primary operations to the site during testing phase because coverage is so much better
- Motorola providing (at no cost) a full TIA/TSB-88 compliant coverage test to demonstrate the value of a quality-controlled design and installation process
- This is what we typically contract for… <u>outcomes, not hardware</u>

We are committed to helping Montana chart its future, and with your continued support, we will help in any way we can.

THANK YOU