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## **SIRN 20/20 Cost Development and Revenue Models**

11.8 Final Report Supplemental Document

**Contract Deliverable # 10**

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TELEVATE, LLC  
8229 BOONE BLVD.  
SUITE 720  
VIENNA, VA 22182  
[WWW.TELEVATE.COM](http://WWW.TELEVATE.COM)

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## Document Overview

This document provides a synopsis of the **SIRN capital and operational expenditure development**, and a summary of the **proposed revenue sources** in fulfillment of Deliverable 10.

## Options Overview

In developing the estimated costs for SIRN, several options were evaluated. This document presents three of those options summarized below; however, the considerations and basis discussions focus on the Hybrid VHF Portable Network option.

| Options Description | 1. Hybrid VHF Portable <sup>1</sup> Network   | 2. Hybrid VHF Mobile Network  | 3. 800 MHz Mobile Network   |
|---------------------|---|---|---|
|                     | <ul style="list-style-type: none"> <li>▪ Network VHF mobile coverage statewide</li> <li>▪ Direct Network VHF Portable service</li> <li>▪ 800 MHz Network Portable service in “Urban Areas”</li> </ul> | <ul style="list-style-type: none"> <li>▪ Network VHF mobile coverage statewide</li> <li>▪ VR-based VHF Portable service</li> <li>▪ 800 MHz Network Portable service in “Urban Areas”</li> </ul> | <ul style="list-style-type: none"> <li>▪ Network 800 MHz mobile coverage statewide</li> <li>▪ VR-based 800 MHz Portable service</li> <li>▪ 800 MHz Network Portable service in “Urban Areas”</li> </ul> |

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<sup>1</sup> Portable refers to a network that fulfills service levels as defined in the Baseline Requirements, and not a ubiquitous statewide on-street portable service. This proposed SIRN architecture does include some VR usage to increase overall network reliability in very remote areas of the State.

1. **VHF-P-S | 800-P-U:** Hybrid VHF and 800 MHz network. Under this option, SIRN is designed to fulfill the Baseline Requirements currently established through stakeholder outreach and the requirements gathering efforts. SIRN would provide Network VHF mobile coverage statewide, and Network VHF Portable per the baseline requirements. In addition to VHF service, 800 MHz Network Portable service in six “Urban Areas” is included. To ensure portable service in areas with limited portable service, all State and Rural/County law enforcement entities will be equipped with “cross-band” analog 800 MHz vehicular repeaters (VR) which extend Network VHF service on the 800 MHz spectrum. These personnel will also be furnished with dual band radios to support VR operation. Dual band radios can additionally be used by State and Rural for Network Portable service during mutual aid response while within the 800 MHz Urban Areas.

Key Urban Area Fire/EMS apparatus and Law Enforcement (“LE”) vehicles will be equipped with VR and Dual Band Portables (i) to enhance in-building operations within urban areas and (ii) to support outbound mutual aid response outside of the 800 MHz Urban area footprint.

Rural and County Fire/Ambulance/EMS (“Fire/AMB”) are currently designed and priced for VHF only trunked service. However, depending on the requirements, some apparatuses may need to be equipped with VR to support Portable service in deficient areas. Some populous counties which are expected to have adequate portable VHF service or traditionally do not use VR’s will likely not be equipped with VR’s; these VRs would be allocated to some Rural and County Fire/EMS to enhance Portable Service.

2. **VHF-M-S | 800-P-U:** Under this option, SIRN is design to provide Mobile Only VHF service statewide<sup>2</sup> with 800 MHz Network Portable service in six “Urban Areas.” Portable network access is primarily provided through Vehicular Repeaters; therefore, *all* State and Rural/County vehicles will be equipped with VRs and Dual-band Portable devices to support Portable service, thereby addressing the Baseline Requirements. Additional network relays and in-building solutions may be required to support paging and portable service where a VR is not present.
3. **800-M-S | 800-P-U:** Under this option, SIRN operates on the 800 MHz<sup>3</sup> spectrum throughout the state. The level of service would be similar to Option 2 with 800 MHz Mobile Only service statewide and 800 MHz Network Portable service in six “Urban Areas.” Portable network access is primarily provided through Vehicular Repeaters; therefore *all* State and Rural/County vehicles will be equipped with “in-band” analog VRs<sup>4</sup> and Trunked Portable devices to support Portable service, thereby addressing the Baseline Requirements. Additional network relays and in-building solutions may be required to support paging and portable service where a VR is not present.

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<sup>2</sup> VHF Network Portable service would be available in the vicinity of the base stations.

<sup>3</sup> 800 MHz refers to both the 700 MHz and 800 MHz narrowband public safety spectrum bands.

<sup>4</sup> In-band VRs would use either 700 MHz or 800 MHz, depending on the SIRN architecture. However, careful consideration is required to ensure sufficient isolation between the network and VR frequency bands; limited isolation within the bands may require much more costly Digital Vehicular Repeaters (VR).

## High Level Design Cost Considerations

### INFRASTRUCTURE COMPONENTS

Below are key elements and assumptions used in developing the capital cost models for the SIRN fixed infrastructure.

- Site Count
  - 145 Tx/Rx, and Rx Only sites (**VHF-P-S | 800-P-U**)
  - 9 – 12 800 MHz sites in Urban Areas
  - Typical Loaded Site Cost (excluding central engineering/PM) — \$430 k
  - 142 existing & 3 new tower builds
- Backhaul Connectivity
  - 95% of sites → Fiber Connectivity (See D8: Tower Database for site-specific data)
  - 5% of sites → Microwave links (See D8: Tower Database for site-specific data)
- Power Systems
  - All new UPS and Battery Plants
  - 50% of sites with new generators and shelters (See D8: Tower Database for site-specific data)
- Traffic Capacity
  - Average 5.25 VHF channels (voice and paging) by site
- PSAP Elements
  - 80 Dispatch Consoles
  - Interfaces to logging recorders, CAD applications
  - CSSI and other interfaces & Integration, as required
- Paging Layer and Related Interfaces
- Fire Station Interfaces and Integration @ 380 Fire stations
- Vendor Services
  - A&E, Site Prep, Structural Analysis, R56 Test
  - Site Engineering/Design
  - Channel Planning, Coordination, Acquisition
  - System Engineering — Optimization, Documentation, DDR/Engineering
  - Project Management Services
  - Construction/Site Management Services
  - Acceptance Testing, Functional Testing, Other
  - Project Coordination/Administration
  - Device Provisioning and Coordination
  - Fleetmap Services and Design

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

- System Decommission
- In-building Solutions
  - @ 106 buildings
- State PMO Team
  - Construction and Field QA/Management Services
  - Independent Certification/Validation Services
  - Engineering, Network Planning, Deployment
  - Project Management/Leadership
  - Technical and Senior Management
  - Expenses (office, travel, vehicle, equipment, etc.)
- 7.5% Contingency
- Assumes 4 – 5 year deployment timeline

## SUBSCRIBER DEVICE COMPONENTS

Below are key elements and assumptions used in developing the capital cost models for the SIRN subscriber devices. Depending on features, capabilities and form factor, land mobile radio devices can range in cost from \$1,500 to \$9,000. Therefore it is important to align the radio type to the needs of the end user. End users were grouped into multiple categories by function (Law Enforcement [LE], Ambulance EMS [AMB], etc.) as well as jurisdiction (County/Rural, Urban) as tabulated and quantified below. In addition, encryption capability is assumed for all law enforcement agencies.

| SUBSCRIBER TYPE BY FUNCTION AND JURISDICTION |       |  |  |                              |
|--|-------|--|--|------------------------------|
|  | Qty   | VHF-P-S   800-P-U  | VHF-M-S   800-P-U  | 800-M-S   800-P-U            |
| State LE Mobile                              | 258   | Tier 2 Mobile + VR*  | Tier 2 Mobile + VR*  | Tier 2 Mobile + VR*          |
| State LE Portable                            | 270   | Tier 1 Portable + Dual                                       | Tier 1 Portable + Dual                                       | Tier 3 Portable 800 MHz Only |
| County LE Mobile                             | 800   | Tier 2 Mobile + VR*  | Tier 2 Mobile + VR*  | Tier 2 Mobile + VR*          |
| County LE Portable                           | 1,042 | Tier 1 Portable + Dual                                       | Tier 1 Portable + Dual                                       | Tier 3 Portable VHF Only     |
| County FD-AMB Mobile                         | 2,380 | Tier 3 Mobile VHF Only                                       | Tier 2 Mobile + VR*  | Tier 2 Mobile + VR*          |
| County FD-AMB Portable                       | 4,448 | Tier 3 Portable VHF Only                                     | Tier 2 Portable + Dual                                       | Tier 3 Portable 800 MHz Only |
| Urban FD-AMB Mobile                          | 378   | 25% Tier 2 Mobile + Dual<br>75% Tier 3 Mobile Only (800 MHz) | 25% Tier 2 Mobile + Dual<br>75% Tier 3 Mobile Only (800 MHz) | Tier 2 Mobile + VR*          |

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

|   |       |   |  |   |
|---|-------|---|--|---|
| Urban FD-AMB Portable                       | 692   | 25% Tier 1 Portable + Dual<br>75% Tier 2 Portable 800 MHz | Tier 2 Portable VHF Only                                     | Tier 2 Portable 800 MHz Only                                |
| Urban LE Mobile                             | 404   | Tier 2 Mobile + Dual                                      | 75% Tier 2 Mobile + Dual<br>25% Tier 3 Mobile Only (800 MHz) | 50% Tier 2 Mobile + VR*<br>50% Tier 3 Mobile Only (800 MHz) |
| Urban LE Portable                           | 1,006 | Tier 1 Portable + Dual                                    | Tier 2 Portable 800 MHz Only                                 | Tier 2 Portable 800 MHz Only                                |
| State DOT Mobile                            | 800   | Tier 4 Mobile VHF Only                                    | Tier 4 Mobile VHF Only                                       | Tier 4 Mobile Only (800 MHz)                                |
| State DOT Portable                          | 150   | Tier 4 Portable VHF Only                                  | Tier 4 Portable VHF Only                                     | Tier 4 Portable 800 MHz Only                                |
| Other Public Safety Mobile                  | 253   | Tier 2 Mobile VHF Only/800 MHz —<br>Various               | Tier 2 Mobile VHF Only/800 MHz —<br>Various                  | Tier 2 Mobile VHF Only/800 MHz —<br>Various                 |
| Other Public Safety Portable                | 410   | Tier 3 Portable 800 MHz Only —<br>Various                 | Tier 3 Portable 800 MHz Only —<br>Various                    | Tier 3 Portable 800 MHz Only —<br>Various                   |
| Public Service (County and Urban) Mobile*   | 5258  | Tier 4 Mobile VHF Only/800 MHz for Urban                  | Tier 4 Mobile VHF Only/800 MHz for Urban                     | Tier 4 Mobile Only (800 MHz)                                |
| Public Service (County and Urban) Portable* | 1075  | Tier 4 Portable VHF Only/800 MHz for Urban                | Tier 4 Portable VHF Only/800 MHz for Urban                   | Tier 4 Portable 800 MHz Only                                |
| *For WITH Public Service Options            |       |   |  |   |

## Subscriber Services

Installation and programming of subscriber related services are also incorporated into the cost models. Certain central activities such as radio configuration profiles development, device registration provisioning, and overall project subscriber deployment management have been classified under the fixed infrastructure Vendor and State PMO services categories.

## Additional Device Considerations

### Reuse of Existing Devices:

- 2,157 upgradeable radios available (See D8: Subscriber Database for details): Typically, upgraded radios will be transitioned from agencies receiving 800MHz or Dual Band radios (urban and law enforcement entities) to County FD-AMB. However, in some cases, the owning agency may retain the upgraded radio regardless of its function (e.g., an upgradeable mid-tier public service radio which would be used for public safety purposes would not be transferred to a public safety agency although that approach as noted in (2) below could yield higher savings.
  - Savings from upgrading these radios **are presented in this document as “Upgrade Savings”**
- 4,875 XTS/XTL in inventory which could be upgraded are reaching end-of-life status. While these radios with an upgrade prior to 2019 can be reused on SIRN, these radios will likely require replacement in the mid-term unless the targeted users begin migrating to other suitable technologies.
  - Savings from reusing these assets have been computed **but are not presented in this document.**
- See Subscriber Database for specific devices and types considered for upgrade.

**Notes:**

1. In general, leveraging existing radios is expected to be an involved logistical process to obtain, provision, and reallocate radios from one agency to another.
2. The value of a reusable asset may vary depending on the agency that receives it. Paying \$800 for an upgrade for a user that would have received a \$4,000 radio yields a saving of \$3,200, while doing the same to an allocating the upgraded radio to an agency slated for a \$2000 new radio would yield a saving of \$1,200.

**Vehicular Repeater Type:**

Analog vs Digital: The costs presented in this document are based on typical vendor ranges for Analog Vehicular Repeaters. Options based on digital VRs were evaluated and precluded from presentation due to the high cost and potentially limited technical benefit. However, it is possible that certain agencies may opt to employ the digital VR. It is noted that furnishing all VRs enumerated in Option 1 with digital capability could raise the overall capital costs by \$6 – \$8 M. Because the Mobile options (2 and 3) rely primarily on VRs for portable usage, the costs would be significantly more.

**Analog Only Portable Radio**

Additionally, under options 2 and 3, Analog Only portable radios were evaluated as a cost cutting measure but are not presented in this document.

## OPERATIONAL COST CONSIDERATIONS

| Operational Components |   |   |
|------------------------|---|---|
| 1                      | Software Maintenance & Licensing        | <ul style="list-style-type: none"> <li>▪ Software updates, patches, technology updates (Vendor Only)</li> </ul>               |
| 2                      | Tower and Site Service                  | <ul style="list-style-type: none"> <li>▪ Infrastructure upkeep, brush removal, shelter maintenance</li> </ul>                 |
| 3                      | Network Operations Center               | <ul style="list-style-type: none"> <li>▪ System monitoring, customer service, trouble ticketing, Tier I support</li> </ul>    |
| 4                      | Mobile Radio Network Field Maintenance  | <ul style="list-style-type: none"> <li>▪ Break/Fix maintenance, preventive maintenance, troubleshooting</li> </ul>            |
| 5                      | Subscriber Device Maintenance           | <ul style="list-style-type: none"> <li>▪ Break/Fix maintenance, preventive maintenance, troubleshooting</li> </ul>            |
| 6                      | Systems Engineering/Operations/Planning | <ul style="list-style-type: none"> <li>▪ On-going enhancements, user provisioning, process and quality engineering</li> </ul> |

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

|   |                                     |  |
|---|-------------------------------------|--|
| 7 | Project Management/Vendor Oversight | <ul style="list-style-type: none"> <li>Program management, contracts managements, legal, administration</li> </ul> |
| 8 | Annual Recurring Fees               | <ul style="list-style-type: none"> <li>Rent, utilities, interconnect costs</li> </ul>                              |

- Site Rent
  - 73 sites government owned – assumed no lease costs
  - Remaining are either incremental (modified) increases to existing leases or new leases
- Item 2: Tower and Site Service – Outsourced service
- Items 3 – 7 use an insourced model based on ITD’s full cost recovery rates
  - Between 29 – 37 total staff our factored, of which approximately 33% are existing staff that would be directly transitioned to SIRN operations

To reflect existing staff and other existing operational costs, the following itemization is included in this document:

- Current OpEx Transfer: These are currently incurred operational costs by DES, DOT, and ITD on State Radio and other State elements which would be incorporated into or transferred directly to SIRN operations.
- New OpEx: Identifies estimated additional OpEx beyond current State agency expenditures on radio communications. It should be noted that local entities have annual expenditures that are not enumerated; therefore, from a holistic, statewide perspective, some portion of these estimates may also fall under “Current OpEx Transfer.”

## ACQUISITION STRATEGY CONSIDERATIONS

A modularly competitive procurement process is recommended to maximize competition within each of the functional elements of SIRN. Estimated costs presented in this document include projected negotiated costs using a mixture of the single and multi-vendor options below. Given the larger vendor market space for subscriber devices, higher savings may come to bear for that category.

- Single-Vendor Model
  - Single Vendor delivers SIRN as a turnkey solution providing ALL subscriber devices
  - Competition is limited to few large radio vendors/integrators
  - However, overall discounts could be higher for a bundled solution
- Multi-Vendor Model
  - Multiple Vendors deliver various elements of SIRN including possibly different vendors for different subscriber models
  - Opens up competition for certain SIRN elements, including low- and mid-tier subscribers
  - Increases internal programmatic, vendor(s) oversight, and quality assurance

## SIRN Lifecycle Ownership Cost Estimates

### CAPITAL NETWORK COST ESTIMATES

| CAPITAL INFRASTRUCTURE COSTS         |  |                        |
|--------------------------------------|--|------------------------|
| CAPEX Network Category               | Description  | Option 1 (\$ Millions) |
| 01_Fixed Radio Networks              | Remote radio network equipment and installation  | 49.8                   |
| 02_Centralized Subsystems/Interfaces | Centralized equipment, interfaces to distributed systems and PSAPs   | 6.6                    |
| 03_Civil and Power Infrastructure    | Shelters, towers, construction, power systems, architectural, civil services   | 20.3                   |
| 04_Professional Services             | Vendor PM, QA/QC, planning, engineering, optimization, training, construction management                                   | 19.5                   |
| 05_State PMO                         | Contracts managements, legal, procurement support, SIRN network planning, QA/QC  | 8.5                    |
| L01_PSAP Subsystems                  | Dispatch Consoles, Interfaces to logging recorders, CAD applications, CSSI and other interfaces & Integration, as required | 6.3                    |
| L02_In-Building Solutions            | In-building solutions – 106 buildings  | 4.9                    |
| L03_Station Alerting Subsystems      | Fire Station Interfaces and Integration @ 380 Fire stations  | 3.3                    |
| <b>GRAND TOTAL</b>                   |  | <b>119.4</b>           |
| <b>GRAND TOTAL (15% Discount)</b>    |  | <b>102.7</b>           |

### CAPITAL SUBSCRIBER DEVICES COST ESTIMATES

## SIRN COST DEVELOPMENT AND REVENUE SOURCES

|  | Base Price              | Discounted / Multi-Vendor |
|--|-------------------------|---------------------------|
| Device Costs Only  | \$ 79,704,412.50        | \$ 66,677,830.31          |
| <b>TOTAL</b><br><i>(Incl. Installation and Programing Costs)</i> | <b>\$ 87,465,197.50</b> | <b>\$ 74,438,615.31</b>   |
| <b>With “Upgrade Savings”</b>                                    | <b>\$ 81,192,797.50</b> | <b>\$ 69,519,207.81</b>   |

### ANNUAL OPERATIONAL NETWORK COST ESTIMATES

|  | Currently Incurred     | New Costs              | TOTAL                   |
|--|------------------------|------------------------|-------------------------|
| Annual Recurring                           | \$ 815,000.00          | \$ 1,745,400.00        | \$ 2,560,400.00         |
| Engineering and Management                 | \$ 296,240.00          | \$ 1,243,840.00        | \$ 1,540,080.00         |
| Mobile Radio Network Field Maintenance     | \$ 1,332,160.00        | \$ 1,128,840.00        | \$ 2,461,000.00         |
| Network Operations/Monitoring Center       | \$ 155,480.00          | \$ 521,640.00          | \$ 677,120.00           |
| Project/Vendor Management & Administration | \$ 377,660.00          | \$ 986,240.00          | \$ 1,363,900.00         |
| Software Maintenance & Licensing           | \$ -                   | \$ 3,830,000.00        | \$ 3,830,000.00         |
| Subscriber Device Maintenance              | \$ -                   | \$ 174,800.00          | \$ 174,800.00           |
| Tower & Site Services                      | \$ 84,000.00           | \$ 220,500.00          | \$ 304,500.00           |
| <b>TOTAL</b>                               | <b>\$ 3,060,540.00</b> | <b>\$ 9,851,260.00</b> | <b>\$ 12,911,800.00</b> |

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

## COMBINED COSTS FOR ALL OPTIONS

| SIRN ESTIMATED LIFECYCLE OWNERSHIP COSTS (IN MILLIONS) |                                |              |                              |              |                           |                  |
|--|--------------------------------|--------------|------------------------------|--------------|---------------------------|------------------|
| Options Description                                    | 1. Hybrid VHF Portable Network |              | 2. Hybrid VHF Mobile Network |              | 3. 800 MHz Mobile Network |                  |
|  | w/ PSER                        | w/o PSER     | w/ PSER                      | w/o PSER     | w/ PSER                   | w/o PSER         |
| Fixed Networks/ Subsystems                             | 90.3                           | 87.0         | 63.0                         | 60.6         | 93.0                      | 89.6             |
| Local Elements – PSAPs, FSA, BDA <sup>5</sup>          | 12.4                           | 12.4         | 12.4                         | 12.4         | 12.4                      | 12.4             |
| Infrastructure Total                                   | <b>102.7</b>                   | <b>99.4</b>  | <b>75.4</b>                  | <b>73.0</b>  | <b>105.4</b>              | <b>102.0</b>     |
| Subscriber Devices Total                               | <b>74.4</b>                    | <b>57.2</b>  | <b>90.6</b>                  | <b>74.2</b>  | <b>80.4</b>               | <b>64.6</b>      |
| Subscriber Upgrade (Savings)                           | (4.9)                          | (4.4)        | (3.3)                        | (2.6)        | N/A                       | N/A <sup>6</sup> |
| TOTAL w/<br>All New Subscribers                        | <b>177.1</b>                   | <b>156.6</b> | <b>166.0</b>                 | <b>147.2</b> | <b>185.8</b>              | <b>166.6</b>     |
| TOTAL Subscriber Upgrade Savings                       | <b>172.2</b>                   | <b>152.1</b> | <b>162.7</b>                 | <b>144.6</b> | <b>N/A</b>                | <b>N/A</b>       |
| Total OpEx   | <b>12.91</b>                   | <b>12.29</b> | <b>9.97</b>                  | <b>9.60</b>  | <b>13.02</b>              | <b>12.37</b>     |
| “Current OpEx Transfer”                                | 3.06                           | 3.06         | 2.78                         | 2.76         | 3.06                      | 3.06             |
| “New OpEx”   | 9.85                           | 9.23         | 7.19                         | 6.85         | 9.96                      | 9.31             |

<sup>5</sup> It is expected Under Options 2 and 3 that additional investments at the local level for network relays and in-building solutions may be required to support paging and enhanced portable service where a VR is not present.

<sup>6</sup> All subscriber devices have to be replaced under these options.

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

## TOTAL LIFECYCLE COSTS – ANNUAL OUTLAYS

SIRN funds may be appropriated commensurate to vendor milestones completed in each of the five years projected for the deployment of the solution. Alternatively, the State legislature may opt to issue bonds or pursue vendor-financed options.

A milestone-based over the five years may be apportioned as follows:

| POTENTIAL MILESTONE-BASED ANNUAL OUTLAYS (IN MILLIONS) |      |      |      |      |      |      |
|--|------|------|------|------|------|------|
|  | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
| Annual Capital Outlay                                  | 11.4 | 52.7 | 43.4 | 41.7 | 28.0 |      |
| Annual Capital Outlay<br>(With 2.5% Inflation)         | 11.4 | 54.0 | 45.6 | 44.9 | 30.9 |      |
| Operational Cost Ramp Up*<br>(With 2.5% Inflation)     |      |      | 3.4  | 7.0  | 10.8 |      |
| Annual 2017 - 2021 Combined Outlay (With Inflation)    | 11.4 | 54.0 | 49.0 | 52.0 | 41.7 |      |
| Post 2021 Operational Costs                            |      |      |      |      |      | 11.1 |

\* Inflation adjusted value of the \$9.8 M in “New” operational estimated costs. The table depicts an equal ramp up of operational capabilities over a three year period starting in Year 3, resulting in a fully staffed and funded O & M structure by Year 5.

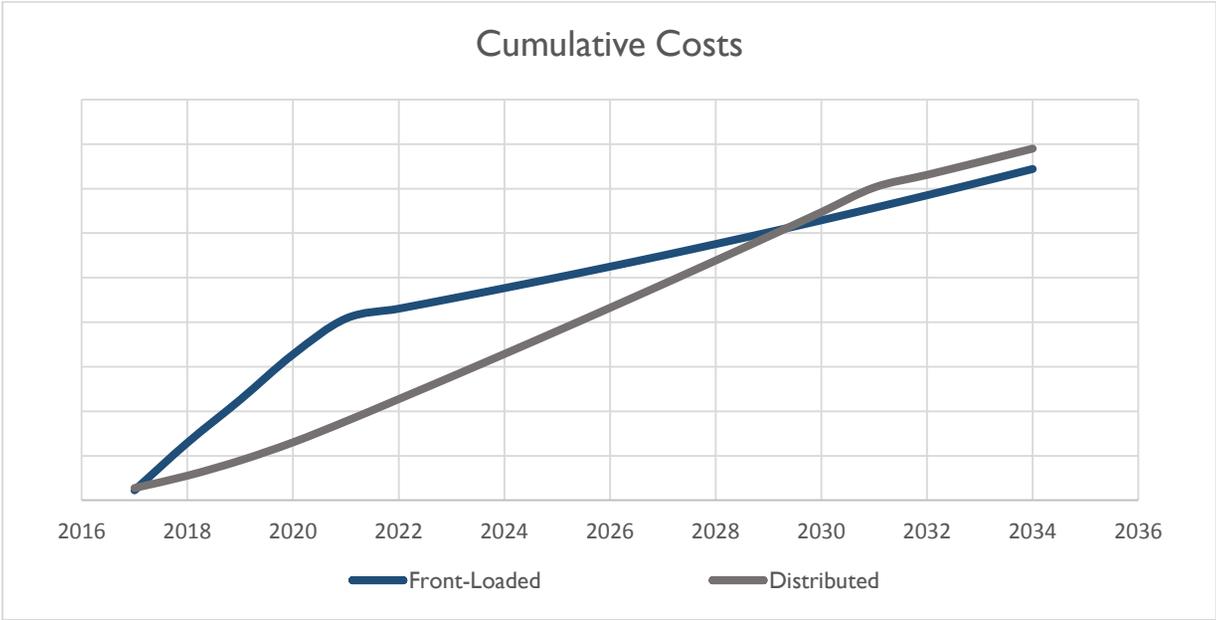
Alternatively under a vendor financed or bonded option (15-year term) in which the capital costs are equally distributed:

|      | Annual CapEx and OpEx (Financed or Bonded) |                   |                 |
|------|--|-------------------|-----------------|
|      | Capital                                    | Operational Costs | TOTAL Per Annum |
| 2017 | \$14.84                                    |                   | \$14.84         |
| 2018 | \$14.84                                    |                   | \$14.84         |
| 2019 | \$14.84                                    | \$3.43            | \$18.27         |
| 2020 | \$14.84                                    | \$7.04            | \$21.87         |
| 2021 | \$14.84                                    | \$10.82           | \$25.65         |
| 2022 | \$14.84                                    | \$11.09           | \$25.92         |
| 2023 | \$14.84                                    | \$11.36           | \$26.20         |

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

|      |         |         |         |
|------|---------|---------|---------|
| 2024 | \$14.84 | \$11.65 | \$26.48 |
| 2025 | \$14.84 | \$11.94 | \$26.78 |
| 2026 | \$14.84 | \$12.24 | \$27.07 |
| 2027 | \$14.84 | \$12.54 | \$27.38 |
| 2028 | \$14.84 | \$12.86 | \$27.69 |
| 2029 | \$14.84 | \$13.18 | \$28.01 |
| 2030 | \$14.84 | \$13.51 | \$28.34 |
| 2031 | \$14.84 | \$13.85 | \$28.68 |
| 2032 |         | \$14.19 | \$14.19 |
| 2033 |         | \$14.55 | \$14.55 |
| 2034 |         | \$14.91 | \$14.91 |

These two approaches are graphically presented below:



## Revenue Sources Overview

The Study explored various new funding initiatives focusing on taxes, fees, fines, and financing options with the following considerations:

- nominal increases could generate significant monies and face limited constituent opposition
- fees and fines where current State rates are significantly lower than comparable states in the nation
- fees, fines and taxes where no increases have been imposed for a long periods (e.g., 1993 for tobacco taxes)
- imposed fee is specifically related to delivering a public safety function (e.g., 911 fees, traffic citations)
- monies affect persons that are typically tourists and other transient population, not North Dakotans (e.g., hotel fees)
- funding sources used successfully in other states

This section provide background and discussion on the evaluated sources and proposes potential modifications to fund SIRN.

### EVALUATED SOURCES

Below is a list of sources that were researched in the Study.

#### Fees

- Traffic citations and tickets
- 911 fee schedule
- Vehicle registration
- Driver license

#### Select Taxes

- Cigarette tax
- Beer, wine, and alcohol taxes
- Gasoline tax
- Lodging tax
- Sales tax

#### Grants

- State Homeland Security Program (SHSP)
- Interoperable Emergency Communications Grant Program (IECGP)
- Community Oriented Policing Services (COPS)
- Assistance to Firefighters Grants (AFG)

#### Vendor Financing

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

- Finance infrastructure and radios
- Low rates, variable repayment terms

North Dakota Oil/Natural Resources Revenue Trends

## WHAT OTHER STATES HAVE DONE

A few examples of strategies other states have pursued are summarized below, many of which are discussed in this document.

| State          | State Funds | Federal Grants | User Fees | 911 Fees | PPP <sup>7</sup> | Motor Vehicle | Bonds | Criminal Offense |
|----------------|-------------|----------------|-----------|----------|------------------|---------------|-------|------------------|
| Connecticut    | ✓           | ✓              |           | ✓        |                  |               |       |                  |
| Florida        |             |                |           |          | ✓                | ✓             |       | ✓                |
| Illinois       |             |                | ✓         |          | ✓                |               |       |                  |
| Indiana        |             |                |           |          |                  | ✓             |       |                  |
| Iowa           |             |                |           | ✓        | ✓                |               |       |                  |
| Kansas         | ✓           |                | ✓         |          |                  |               |       |                  |
| Minnesota      |             |                |           | ✓        |                  |               | ✓     |                  |
| Mississippi    | ✓           |                |           |          |                  |               |       | ✓                |
| Ohio           |             | ✓              | ✓         |          |                  |               | ✓     |                  |
| Oklahoma       | ✓           | ✓              |           |          |                  | ✓             |       |                  |
| South Carolina |             |                | ✓         |          | ✓                |               |       |                  |
| West Virginia  | ✓           |                |           | ✓        |                  |               |       |                  |

<sup>7</sup> Typically, public/private partnership between state government, local governments, power utilities, and a prime radio system vendor(s) which may build, operate and manage the infrastructure, generating fees directly from the users.

## BACKGROUND ON KEY POTENTIAL FUNDING SOURCES IN NORTH DAKOTA

### Traffic Violation Citations

The table below summarizes the current fines for traffic violations in the State and compares them against other states in the region.

|                                       | North Dakota   | Minnesota            | South Dakota   | Iowa   |
|---------------------------------------|--|----------------------|--|--|
| <b>Speeding<sup>8</sup></b>           | <b>Summary Overview<sup>9</sup></b><br>15 mph on highway: \$15<br><15 mph (city road): \$12<br>>20 mph (city road): \$49 | All violations \$145 | 1 to 5 mph over: \$85<br>6 to 10 mph over: \$106<br>11 to 15 mph over: \$125<br>16 to 20 mph over: \$145<br>21 to 25 mph over: \$165<br>26 and up: \$220 | 1 to 5 mph over: \$87<br>6 to 10 mph over: \$114<br>11 to 15 over : \$168<br>16 to 20 over : \$181.50<br>21 to 25 over : \$195 + \$5<br>for each mph over 20 |
| <b>Failure to obey stop sign</b>      | \$20 (Rural), \$40 (Dickinson and Minot), \$50 (Bismarck), \$71 (Grand Forks), \$100 (Fargo)                             | \$128                | \$120  | \$195  |
| <b>Driving without proper license</b> | \$250 to \$1,000   | \$178.00             | \$120  | \$250  |
| <b>Texting and driving</b>            | \$100.00   | \$225                | \$100  | \$30   |

State and local entities collect approximately \$3.5 M per annum (See Table).

| 2013            | 2014            | 2015            |
|-----------------|-----------------|-----------------|
| \$ 3,270,461.59 | \$ 3,305,282.00 | \$ 3,530,046.42 |

<sup>8</sup> Many law enforcement agencies surveyed during the SIRN considered the State's citation rates too low to deter violations.

<sup>9</sup> See Appendix A: Speeding Violation Fines

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

## Motor Vehicle Related Fees

- 845,109 ND vehicles registered in 2015
- 527, 541 licensed ND drivers in 2015

|                                       | North Dakota | Minnesota                         | South Dakota | Iowa    |
|---------------------------------------|--------------|-----------------------------------|--------------|---------|
| <b>Non-Commercial License Renewal</b> | \$15.00      | \$26.25                           | \$28.00      | \$20.00 |
| <b>Motor Vehicle Registration</b>     | \$49.00      | \$35.00 minimum, varies by County | \$75.60      | \$55.00 |

## Lodging Taxes

A nominal increase of \$1 or \$2 per night per room would generally not affect business or tourism travel but may yield substantial revenue to fund much needed projects. The Natural Resources industry triggered a significant boom lodging industry in the first half of this decade which has since decelerated; the recommendations provided later in this document account for this deceleration and employs conservative estimates. The table summarizes recent trends in hotel room occupancy in the State.<sup>10</sup>

| Year                                  | 2010          | 2011          | 2012          | 2013          | 2014          | 2015          |
|---------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b># of rooms</b>                     | <b>15,539</b> | <b>16,221</b> | <b>18,523</b> | <b>20,824</b> | <b>22,778</b> | <b>24,205</b> |
| # of possible room occupancy per year | 5,671,735     | 5,920,665     | 6,760,895     | 7,600,760     | 8,313,970     | 8,834,825     |
| % occupancy                           | 68.6%         | 74.7%         | 73.6%         | 66.0%         | 67.1%         | 55.4%         |
| Total # of rooms rented               | 3,890,810.    | 4,422,737     | 4,976,019     | 5,016,502     | 5,578,674     | 4,894,493     |
| Percent change                        |               | 14%           | 13%           | 1%            | 11%           | -12%          |

## Cigarette Taxes

### Overview

<sup>10</sup> North Dakota Tourism Annual Report 2015." North Dakota Tourism Facts and Reports, n.d. Web. 6 May 2016. <http://www.ndtourism.com/information/north-dakota-tourism-facts-and-reports>

- 56,100,000 pack sold per year
- Cost of a pack of cigarettes is \$4.51, the National average is \$5.95
- ND tax is \$0.44 per pack; 48<sup>th</sup> highest in US
- Tax rate not increased since 1993
- Current Average Annual Revenue \$24,684,000

## Alcohol Taxes

### Overview

- Beer tax is \$0.39 per gallon; 16<sup>th</sup> highest in US
- Wine tax is \$1.06 per gallon; 18<sup>th</sup> highest in US
- Liquor tax is \$4.66 per gallon; 30<sup>th</sup> highest in US

## Gas Taxes

### Overview

- 468,720,000 gallons of gasoline/diesel in 2014
- \$0.23 tax per gallon of gas
- 32<sup>nd</sup> highest in the US
- Current Average Annual Revenue \$107,805,600

## 911 Fees

North Dakota counties collect between \$1.00 and \$1.50 monthly per telephone line; some of these “911 fees.” The twenty four counties without 911 call-taking centers direct \$0.44 to the State DES, which provides these services to those counties. Many of these funds are **already encumbered** for various PSAP equipment and staff but are also used to fund dispatch center equipment.

| 911 Revenue (2013) <sup>11</sup> |             |
|----------------------------------|-------------|
| State Radio Counties             | \$1,237,574 |
| Non-State Radio Counties         | \$8,760,748 |

<sup>11</sup> Emergency Services Communication in North Dakota – A Biennial Status Report, 2014

## SIRN COST DEVELOPMENT AND REVENUE SOURCES

### ND State Homeland Security Program (SHSP) Grants

While federal grants have been declining, the State has received an annual average of \$3.5 M in State Homeland Security Programs over the past five years (See Table Below). These funds are allocated throughout the State for several public safety communications and emergency management purposes; however, with the consolidation of all state and local systems under the SIRN plan, there may be an opportunity to allocate a portion of the SHSP funds to elements of SIRN such as PSAP equipment.

| Year               | Grant Award            | Sum of Purchase Radio Equipment |
|--------------------|------------------------|---------------------------------|
| 2006               | \$6,270,000.00         | \$ 5,175,012.05                 |
| 2007               | \$6,298,000.00         | \$ 5,711,748.58                 |
| 2008               | \$6,652,000.00         | \$ 681,884.95                   |
| 2009               | \$6,524,500.00         | \$ 1,571,992.24                 |
| 2010               | \$6,613,200.00         | \$ 1,060,971.79                 |
| 2011               | \$5,137,205.00         | \$ 3,035,718.97                 |
| 2012               | \$2,801,316.00         | \$ 1,229,408.29                 |
| 2013               | \$3,459,364.00         | \$ 105,815.89                   |
| 2014               | \$3,733,000.00         | \$ 55,683.92                    |
| 2015               | \$3,734,000.00         | \$ 228,609.65                   |
| 2016               | N/A                    | N/A                             |
| <b>Grand Total</b> | <b>\$51,222,585.00</b> | <b>\$ 18,856,846.33</b>         |

### Vendor Financing Overview

Televate contacted all major LMR systems vendors including Harris, Motorola, EF Johnson, and Tait to document information regarding their vendor financing plans. Typically, the loan terms are fairly consistent:

- Duration of 12 months to 15 years (shorter duration for radio devices)
- Loan values from \$25,000 to \$500 m
- Payment made monthly, quarterly, semi-annually, annually
- Interest rates for credit worthy municipalities would be between 2.5-3.0%
- Vendors also willing to build and lease back the network under mutually agreeable terms

The following table illustrates prospective payment plans based on a 10 year loan period at a 3% loan rate:

## SIRN COST DEVELOPMENT AND REVENUE SOURCES

| Loan Amount       | Interest | Period/Years | Monthly Payment | Total Payment     | Total Interest   | Percentage Repayment |
|-------------------|----------|--------------|-----------------|-------------------|------------------|----------------------|
| \$ 50,000,000.00  | 3%       | 10           | \$ 482,803.72   | \$ 57,936,446.82  | \$ 7,936,446.82  | 14%                  |
| \$ 100,000,000.00 | 3%       | 10           | \$ 965,607.45   | \$ 115,872,893.64 | \$ 15,872,893.64 | 14%                  |
| \$ 150,000,000.00 | 3%       | 10           | \$ 1,448,411.17 | \$ 173,809,340.46 | \$ 23,809,340.46 | 14%                  |

### Oil and Gas Extraction and Production Tax Overview

The State’s recent economic boom has been directly tied to the substantial increase in natural resources revenue. While there has been a notable decline over the past two years, as indicated in the table below, the natural resources revenue over this “bust” time frame still exceed historical levels by a factor of five. Due to this significant boom, the *State’s Strategic Investment & Improvement Fund* and *Political Subdivision Allocation Fund* have allocations of \$316 M and \$92 M over the 2015 – 2017 biennium.<sup>12</sup> The State may elect to use a small fraction of these oil tax allocations to fund an important public safety cause in the near term. Gradually, as the cost of oil stabilizes, so too will the State’s natural sources revenues and economic activity, in general. Crude oil costs have increased by two-fold in the first half of 2016; the World Bank data forecasts average per barrel sustained costs of \$60 by 2020, \$85 by 2025.<sup>13</sup> The Historical Crude Oil Prices graphic further illustrates general considerations: oil prices in the past five years have indeed been higher than average leading to an even higher boom. However, the prices experienced in late 2015 and early 2016 were at historically low levels. Most data sources indicate that while the cost of oil may not return to the peaks of 2014 in the near future that significant increases are expected en route to more stable prices. (Oil prices have already doubled in 6 months since the January 2016 lows of \$22.)

| North Dakota Total oil & gas tax revenue <sup>14</sup> |                 |
|--|-----------------|
| 2005–2007  | \$352,600,000   |
| 2007–2009  | \$799,100,000   |
| 2009–2011  | \$1,500,000,000 |
| 2011–2013  | \$4,680,000,000 |

<sup>12</sup> Citation

<sup>13</sup> World Bank Commodities Price Forecast (nominal US dollars), Released: January 20, 2016.

<[http://www.worldbank.org/content/dam/Worldbank/GEP/GEP2015a/Price\\_Forecast.pdf](http://www.worldbank.org/content/dam/Worldbank/GEP/GEP2015a/Price_Forecast.pdf)>

<sup>14</sup> “Budget and Fiscal Trends”. North Dakota Legislative. January 2016. 4. Web. 19 May 2016.

< <http://www.legis.nd.gov/files/resource/trends/budget-and-fiscal-trends-2016-01.pdf>>

“State of North Dakota Legislative Appropriations 2015-17 Biennium”. 18 February 2016. 25-27. Web. 18 May 2016.

<<https://www.nd.gov/omb/sites/omb/files/documents/agency/financial/state-budgets/docs/budget/appropbook2015-17.pdf?ts=2016021821>>

## SIRN COST DEVELOPMENT AND REVENUE SOURCES

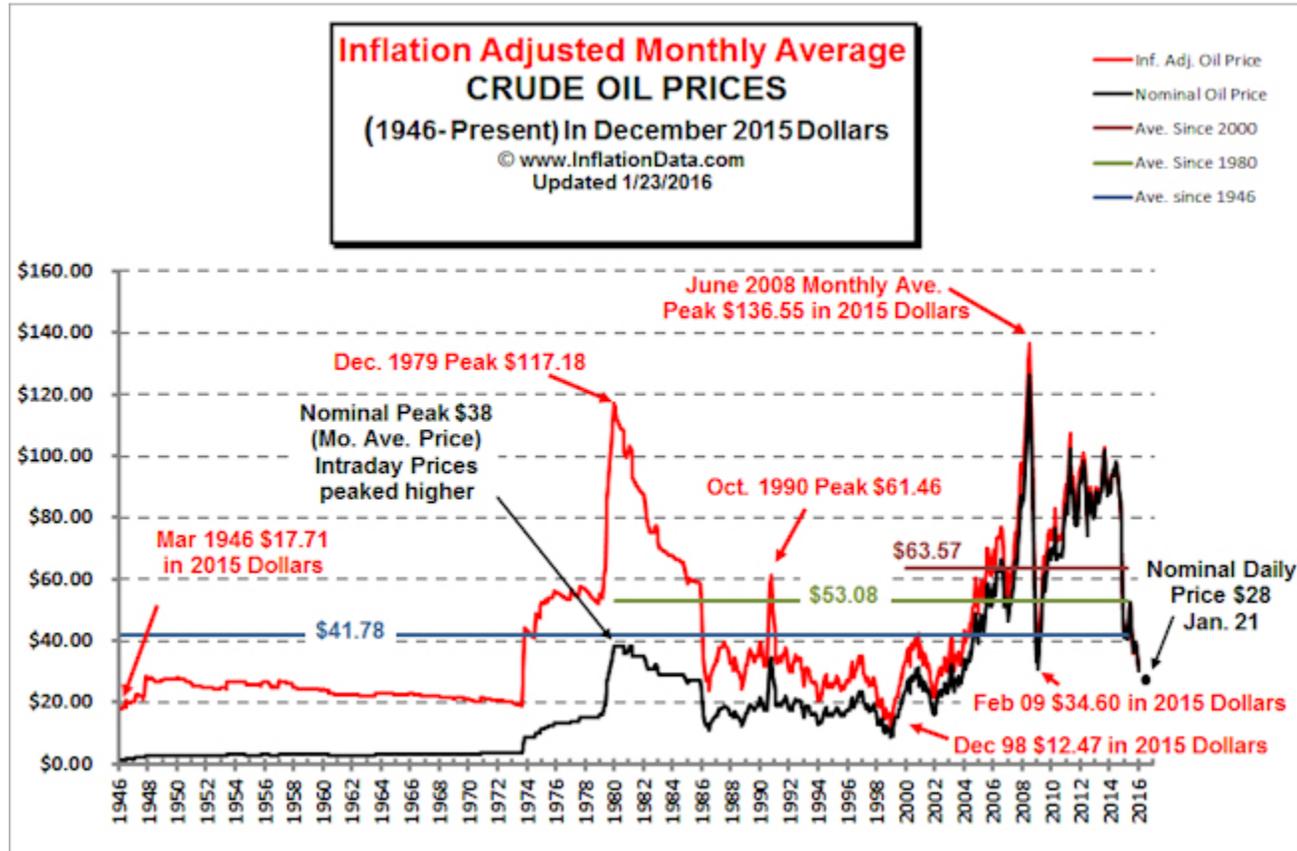
|                               |                 |
|-------------------------------|-----------------|
| <b>2013-2015</b>              | \$6,430,000,000 |
| <b>2015-2017<sup>15</sup></b> | \$3,430,000,000 |

| <b>World Bank Oil Price Projections/Barrel</b> |             |             |             |             |               |             |             |             |             |             |
|--|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|
| <b>Year</b>                                    | <b>2012</b> | <b>2013</b> | <b>2014</b> | <b>2015</b> | <b>2016**</b> | <b>2017</b> | <b>2018</b> | <b>2019</b> | <b>2020</b> | <b>2025</b> |
| <b>Per Barrel</b>                              | \$ 104.03   | \$ 104.08   | \$ 96.20    | \$ 50.80    | \$ 41.00      | \$ 50.00    | \$ 53.30    | \$ 56.70    | \$ 60.40    | \$ 82.60    |

Additionally, current funds accrued include:

- Strategic Investment & Improvement Fund (2015-2017 allocation of \$316,222,602)
- Political Subdivision Allocation Fund (2015-2017 allocation of \$92,666.830)

<sup>15</sup> The 2015-2017 revenue contains both actual revenues for 2015 and projected data for 2016-2017.



**Historical Crude Oil Prices**

### User Fees

Several LMR system operators at the state and local levels assess a one-time, monthly or annual fees to support radio networks. Typically, given the high overall cost of LMR systems per user, those fees are to used supplement a portion of the recurring operational fees. Monthly fees range from \$15 – \$50. The proposed SIRN cost-sharing models (See deliverable 5.3) suggest a portion of the overall capital and operational costs be covered by local entities. These entities may pursue a subscription-based approach to raise those costs.

# SIRN COST DEVELOPMENT AND REVENUE SOURCES

## RECOMMENDED SOURCES ESTIMATED REVENUE SUMMARY

The following table provides possible incremental changes to each of the funding sources discussed above and the corresponding estimated annual revenue.

| Option                    | Proposed Changes and Estimated Annual Revenue  | % SIRN Cost <sup>16</sup>  | Probability            |
|---------------------------|--|--|------------------------|
| Cigarette Tax Increase    | <ul style="list-style-type: none"> <li>▪ <b>\$0.25 Per Pack → \$ 14 M</b></li> <li>▪ <b>\$0.50 Per Pack → \$ 28 M</b></li> <li>▪ <b>\$1.00 Per Pack → \$ 56 M</b></li> </ul> | <ul style="list-style-type: none"> <li>▪ 70 %</li> <li>▪ 145%</li> <li>▪ 290%</li> </ul> | Medium/High            |
| Hotel Lodging Tax         | <ul style="list-style-type: none"> <li>▪ <b>\$0.50 Per Night → \$ 1.5 – 2.0 M</b></li> <li>▪ <b>\$1.00 Per Night → \$ 3 – 4.0 M</b></li> </ul>                               | <ul style="list-style-type: none"> <li>▪ 10%</li> <li>▪ 20%</li> </ul>                   | Low/Medium             |
| Traffic citation Increase | <ul style="list-style-type: none"> <li>▪ <b>Double → \$ 3.5 M</b></li> <li>▪ <b>Triple → \$ 7 M</b></li> <li>▪ <b>Quadruple → \$ 10.5 M</b></li> </ul>                       | <ul style="list-style-type: none"> <li>▪ 18%</li> <li>▪ 35%</li> <li>▪ 55%</li> </ul>    | Medium                 |
| Driver's License Fee      | <ul style="list-style-type: none"> <li>▪ <b>\$10 Increase → \$ 5.2 M</b></li> <li>▪ <b>\$15 Increase → \$ 7.9 M</b></li> </ul>   | <ul style="list-style-type: none"> <li>▪ 27%</li> <li>▪ 42%</li> </ul>                   | Low                    |
| Vehicle Registration Fee  | <ul style="list-style-type: none"> <li>▪ <b>\$10 Increase → \$ 8.4 M</b></li> <li>▪ <b>\$15 Increase → \$ 12.7 M</b></li> </ul>  | <ul style="list-style-type: none"> <li>▪ 45%</li> <li>▪ 65%</li> </ul>                   | Medium                 |
| 911 Fee                   | <ul style="list-style-type: none"> <li>▪ <b>Depends on County</b></li> </ul>   |  | Medium (for PSAP Only) |
| Gas Tax Increase          | <ul style="list-style-type: none"> <li>▪ <b>2.5c Per Gallon → \$ 12 M</b></li> <li>▪ <b>5c Per Gallon → \$ 24 M</b></li> </ul>   | <ul style="list-style-type: none"> <li>▪ 65 %</li> <li>▪ 125%</li> </ul>                 | Low/Medium             |
| Alcohol Tax Increase      | <ul style="list-style-type: none"> <li>▪ <b>10c Per Gallon → \$ 3.4 M</b></li> <li>▪ <b>20c per Gallon → \$ 6.8 M</b></li> </ul>   | <ul style="list-style-type: none"> <li>▪ 18%</li> <li>▪ 36%</li> </ul>                   | Low/Medium             |

<sup>16</sup> As a percentage of the projected combined capital and operational costs of SIRN. As illustrated in the table, several sources could be used to cover a substantial percentage of SIRN; alternatively, certain proposed sources could cover the full amount.

## Appendix A: Speeding Violation Fines

- Speeding 6 to 10 mph over the speed limit: \$5 plus \$1 for each mph over 5 mph (39-06.1-06(3))
- Speeding 11 to 15 mph over the speed limit: \$10 plus \$1 for each mph over 10 mph (39-06.1-06(3))
- Speeding 16 to 20 mph over the speed limit: \$15 plus \$2 for each mph over 15 mph (39-06.1-06(3))
- Speeding 21 to 25 mph over the speed limit: \$25 plus \$3 for each mph over 20 mph (39-06.1-06(3))
- Speeding 26 to 35 mph over the speed limit: \$40 plus \$3 for each mph over 25 mph (39-06.1-06(3))
- Speeding 36 to 45 mph over the speed limit: \$70 plus \$3 for each mph over 35 mph (39-06.1-06(3))
- Speeding 46+ mph over the speed limit: \$100 plus \$5 for each mph over 45 mph (39-06.1-06(3))
  
- Speeding on highway 55 mph limit, 6 to 10 mph over the speed limit: \$15 plus \$2 for each mph over 5 mph over the limit (39-06.1-06(7))
- Speeding on highway 55 mph limit, 11 to 15 mph over the speed limit: \$25 plus \$3 for each mph over 10 mph over the limit (39-06.1-06(7))
- Speeding on highway 55 mph limit, 16 to 20 mph over the speed limit: \$40 plus \$3 for each mph over 15 mph over the limit (39-06.1-06(7))
- Speeding on highway 55 mph limit, 21 to 25 mph over the speed limit: \$55 plus \$3 for each mph over 20 mph over the limit (39-06.1-06(7))
- Speeding on highway 55 mph limit, 26 to 35 mph over the speed limit: \$70 plus \$3 for each mph over 25 mph over the limit (39-06.1-06(7))
- Speeding on highway 55 mph limit, 36 to 45 mph over the speed limit: \$120 plus \$5 for each mph over 35 mph over the limit (39-06.1-06(7))
- Speeding on highway 55 mph limit, 46+ mph over the speed limit: \$170 plus \$5 for each mph over 45 mph over the limit. (39-06.1-06(7))
  
- Speeding on highway 70 mph limit, 6 to 10 mph over the limit: \$40
- Speeding on highway 70 mph limit, 11 to 15 mph over the limit: \$60 (39-06.1-06(11))
- Speeding on highway 70 mph limit, 16 to 20 mph over the limit: \$80 (39-06.1-06(11))
- Speeding on highway 70 mph limit, 21 to 25 mph over the limit: \$100 (39-06.1-06(11))
- Speeding on highway 70 mph limit, 26 to 30 mph over the limit: \$125 (39-06.1-06(11))
- Speeding on highway 70 mph limit, 31 to 35 mph over the limit: \$150 (39-06.1-06(11))
- Speeding on highway 70 mph limit, 36+ mph over the limit: \$150 plus \$5 for each mph over 35 mph over the limit (39-06.1-06(11))