

**South Portland City Council  
Position Paper of the City Manager**

***Subject:***

**ORDER #3-16/17 – Transferring \$44,069 from unassigned fund balance to the Bus Reserve Account and appropriating \$44,069 to the Bus Service Contract Engineering Services Account to fund a study and implement a pilot project concerning traffic signal prioritization for South Portland Bus Service. Passage requires majority vote.**

***Position:***

The South Portland Bus Service has been successful in obtaining funding through PACTS for a study and implement a pilot project concerning traffic signal prioritization for our City buses. The total cost of the project is \$220,342 with the Federal Transit Administration funding \$176,273 and the City's local share of \$44,069.

The Maine Mall and the Knightville area traffic signal systems include software modules at 13 intersections for the implementation of Transit Signal Priority (TSP) systems. These intersections are located at the following locations and are on bus routes 24A and 25B

- |  |                                       |
|--|---------------------------------------|
| 1. Exit 3 Off-Ramp to Westbrook Street | 7. Westbrook at Broadway              |
| 2. Westbrook Street at Western Avenue  | 8. Running Hill Road at Cummings Road |
| 3. Gorham Road at Western Avenue       | 9. Casco Bay Bridge at Erskine Drive  |
| 4. Gorham Road at Foden Road           | 10. Broadway at Waterman Drive        |
| 5. Gorham Road at Maine Mall Road      | 11. Broadway at Anthoine Street       |
| 6. Maine Mall Road at Western Avenue   | 12. Broadway at Ocean Street          |
|  | 13. Broadway at Cottage Road          |

The software has never been activated for use by the South Portland Bus Service. The purpose of the study is to assess the benefits of TSP at these 13 locations and determine if further investment in the technology is warranted for the South Portland Bus Service route system, as well as the PACTS Region.

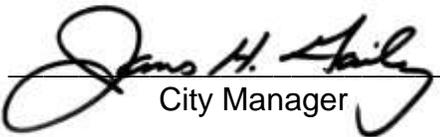
The second part of the project is to implement the TSP system which includes confirming that all the software is up to date, purchase and install any software if needed, purchase and install radio communications in all the buses and test and program the traffic controllers, etc.

I am recommending funding for the local share of \$44,069 be transferred from unassigned fund balance to the Bus Service Reserve Account.

Art Handman will be at Wednesday's meeting to answer any questions.

***Requested Action:***

Council passage of ORDER #3-16/17.

  
City Manager



CITY OF SOUTH PORTLAND

THOMAS E. BLAKE  
Mayor

JAMES H. GAILEY  
City Manager

EMILY F. CARRINGTON  
City Clerk

SALLY J. DAGGETT  
Jensen Baird Gardner & Henry

**IN CITY COUNCIL**

**ORDER #3-16/17**

District One  
CLAUDE V. Z. MORGAN

District Two  
PATRICIA A. SMITH

District Three  
EBEN C. ROSE

District Four  
LINDA C. COHEN

District Five  
BRAD FOX

At Large  
MAXINE R. BEECHER

At Large  
THOMAS E. BLAKE

**ORDERED**, that the City Council hereby approves transferring forty-four thousand sixty-nine dollars (\$44,069) from unassigned fund balance to the Bus Reserve Account; and

**BE IT FURTHER ORDERED**, that the City Council hereby appropriates forty-four thousand sixty-nine dollars (\$44,069) to the Bus Service Contract Engineering Services Account to fund a study and implement a pilot project concerning traffic signal prioritization for South Portland Bus Service.

Fiscal Note: \$44,069

Dated: July 6, 2016



CIVIL ENGINEERING SURVEYING LANDSCAPE ARCHITECTURE

## Memorandum

**15506**

**To: Art Handman**

**From: Steve Sawyer**

**Date: April 14, 2016**

**Subject: Transit Signal Priority (TSP) Implementation Study Proposal – South Portland**

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### Background

When the Maine Mall Traffic Signal System was designed and constructed in 2004-5, it included software modules at 8 intersections for the implementation of Transit Signal Priority (TSP) on what is now known as bus routes 24A and 24B. These intersections are as follows and are shown on the attached map:

- Exit 3 Off-Ramp to Westbrook Street
- Westbrook Street at Western Avenue
- Gorham Road at Western Avenue
- Gorham Road at Foden Road
- Gorham Road at Maine Mall Road
- Maine Mall Road at Western Avenue
- Westbrook at Broadway
- Running Hill Road at Cummings Road

Later in 2007-8 Sebago designed some signal improvements in the Knightville area of the City and this project included TSP software in 5 additional intersections, which affect all three South Portland bus routes – 21, 24A and 24B . Specifically these were:

- Casco Bay Bridge at Erskine Drive
- Broadway at Waterman Drive
- Broadway at Anthoine Street
- Broadway at Ocean Street
- Broadway at Cottage Street

Unfortunately, for a variety of reasons, none of this software was ever activated for use by South Portland Bus. As such, this Study Proposal has two objectives:

- 1) To assess the benefits of TSP by activating the 13 intersections that are currently equipped with this capability and to determine the cost benefit of further investment in this technology elsewhere within the South Portland Bus route system and the PACTS Region as a whole, and
- 2) If TSP is proven to provide measurable benefits to South Portland Bus, compare the two primary TSP technologies currently available today (optical and radio-based gps) to determine if one technology is superior to the other given that the PACTS area has no active TSP today and that South Portland would be setting the standard for the rest of the region.

To address these two objectives, we have outlined the following comprehensive assessment that contains options depending upon the level of funding that may be available for this evaluation. Our scope will:

- Review the vintage of software in the 13 existing cabinets listed above and update it, as necessary.
- Purchase and install Tomar “optical” emitters for the 8 South Portland buses. In addition, we could purchase and install EMTRAC radio-based “gps” Vehicle Computer Units (VCU’s) with Omni-directional antennas for each the South Portland bus to provide additional positioning functionality as well as priority request transmissions to the TSP intersections using radio-based gps technology.
- Test and program all 13 signal controllers with the appropriate TSP logic for each intersection based on the direction of travel for buses on bus routes 24A and 24B.
- Analyze “before” and “after” travel time data for both the optical and radio-based gps technologies using GPCOG’s Clever Devices AVL tracking system (for the optical) and EMTRAC’s AVL tracking system (for the gps) to quantify the effectiveness of the TSP implementation.
- If the level of funding for this evaluation does not permit purchasing and testing both technologies, we have outlined a literature-based assessment for the “gps” technology that could be used to draw some generalized conclusions on the merits of these systems versus the “optical” types and what the cost comparisons might be for future system-wide planning.

**Scope of Work and Costs**

**Task 1** - Visit and verify that all 13 intersections listed above have a basic version of TSP software. Determine which ones need to be updated to the current version of this product. Purchase and install the updated software where called for. We are assuming that 12 of the 13 intersections will require a software upgrade. The intersection of Broadway/Waterman was just upgraded last year, so this intersection should be current.

$$12 \times \$1,250 \text{ each} = \$15,000$$

**Task 1A** – Install EMTRAC Priority Detector Unit cards in the 13 intersections that have TSP capabilities to process the EMTRAC VCU communications from the buses.

$$13 \times \$6,125 = \$79,625$$

**Task 2** – Purchase and install Tomar light based emitters with Visible Light Filters in all 8 South Portland buses. We suggest purchasing these units rather than renting them since in the short term this technology would be the least expensive to implement.

$$8 \times \$1,425 \text{ each} = \$11,400$$

**Task 2A** – Purchase and install EMTRAC VCU's with radio communications in all 8 South Portland buses.

$$8 \times \$3,050 = \$24,400$$

**Task 3** – Test and program all 13 traffic controllers with the appropriate logic for TSP based on the specific bus routes passing through each intersection.

$$13 \times \$1,550 \text{ each} = \$20,150$$

**Task 4** – Sebago will coordinate with GPCOG/Clever Devices and EMTRAC to get AVL tracking reports for the selected bus routes (or portions of routes) that would be affected by the intersections activated with TSP programming. We plan to monitor the chosen bus routes (or route segments) for 28 days prior to implementing TSP. This will create a baseline from which to assess TSP improvements. Then we will monitor the bus performance for two 28 day periods following the activation of TSP with the optical and radio-based gps technologies. From these two subsequent monitoring periods we should have sufficient data from which to draw some statistically valid improvement results. We will then be able to use the "before" and "after" travel time run data (exclusive of bus stop times) to determine some valid and useful system-wide improvement information, which can serve as the basis for determining if TSP is a worthwhile investment for South Portland Bus and the PACTS Region. We will weigh the cost of upgrading existing intersections against the benefits of the expected travel time savings in the form of a cost/benefit analysis. The final deliverable will be a Report containing these findings and our conclusions on the cost effectiveness of TSP for South Portland, as well as the differences in the effectiveness and performance of the two currently available TSP technologies.

420 hours at \$90/hour	=	\$37,800
Clever Devices Support	=	\$ 7,367
EMTRAC Support	=	<u>\$24,600</u>
Total	=	\$69,767

**Task 4A** – If funding levels do not permit a field test of the “gps” technology, then Sebago will conduct a literature-based assessment of the two technologies and provide a qualitative evaluation for consideration by South Portland Bus and PACTS. This assessment would use other studies elsewhere in the country and try to adapt them to the PACTS Region. Our final Report in this case would attempt to include some cost/benefit figures that could aid in guiding the Region in their decision making regarding TSP implementation.

360 hours at \$90/hour	=	\$32,400
Clever Devices Support	=	<u>\$ 7,367</u>
<b>Total</b>	=	<b>\$39,767</b>

**Cost Summary**

**Option 1 – Field Testing both Optical and GPS Technologies (Tasks 1, 1A, 2, 2A, 3, and 4)**

Task 1 -	\$ 15,000
Task 1A -	\$ 79,625
Task 2 -	\$ 11,400
Task 2A -	\$ 24,400
Task 3 -	\$ 20,150
Task 4 -	<u>\$ 69,767</u>
<b>Total</b>	<b>\$220,342</b>

**Option 2 – Field Testing the Optical Technology with a Comparative Literature-based Evaluation of GPS Technology (Tasks 1, 2, 3, and 4A)**

Task 1 -	\$ 15,000
Task 2 -	\$ 11,400
Task 3 -	\$ 20,150
Task 4A -	<u>\$ 39,967</u>
<b>Total</b>	<b>\$ 86,517</b>

Let me know if this proposal addresses your expectations and if you need anything else from us in this regard.

Attachment: Traffic Signal Maps

