

**MEMORANDUM**

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DATE: Monday, March 4, 2013

TO: Mayor Don Gough  
Lynnwood City Council

FROM: Lorenzo Hines Jr., Finance Director

SUBJECT: Completion of the City's Data Center Migration

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2 The City's data center is comprised of an integrated mesh of devices which allows the  
3 city to present secure, stable, and reliable access to its data. Facilitation of these  
4 activities requires several divisions of equipment that adhere to specific methodologies  
5 and standards.

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7 This environment was compromised on July 3<sup>rd</sup> and 4<sup>th</sup> 2011 due to an overheating  
8 event where the temperature condition exceeded 140 degrees and lasted thirty (30+)  
9 plus hours. This resulted in an unstable environment and compromised all electronic  
10 equipment contained within the City's data center. This compromised devices for both  
11 the Information Services division of Administrative Services and the Traffic division of  
12 Public Works. Soon after the event, an emergency replacement plan was initiated, and  
13 processes begun, to remedy the compromised equipment. After seven months of  
14 negotiations with our insurance company, the City received a \$2,098,731 settlement to  
15 fund equipment replacement. Council provided the expenditure authority in Ordinance  
16 2930.

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18 City Data Center Architecture

19 Prior to the event the data center's component's included a wide variety of equipment  
20 including:

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- 22 • Fifty-one (51) individual physical servers. These servers run applications and  
23 provide data storage as needed.
  - 24
  - 25 • Several network security devices that protect the city from intrusion, data  
26 instability, and malicious content or contamination.
  - 27
  - 28 • Specific monitoring equipment to facilitate RCW, LMC, HIPPA, PCI, Snocom  
29 911, and CJIS mandates and or certifications for city operations and compliance  
30 for interoperability with external Federal, State, and neighboring City agencies.
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- Switches and routers to manage the delivery and transport of data traffic to and from servers, staff, and applicable entities.
  - Backup devices for the offloading of data to tape media to be relocated to an external safe location for emergency conditions related to disaster recovery scenarios.
  - Physical and environmental components for racks, bracing, monitoring, and power are required as safe guards to protect assets.
  - All city services and equipment are managed and maintained by internal staff.

Replacement Architecture

We completed our migration from the compromised equipment to the new environment on January 13, 2013. The following is a narrative of our replacement activities:

- Server Hardware was replaced with a shared physical server platform. This single physical platform, as built today, can accommodate one hundred plus virtual servers. Forty five of the old physical servers were converted into forty five virtual servers. Six physical servers were moved to six new individual physical hardware servers, as their application or purpose is not compatible with the virtualization platform. A few of these remain to be converted. This virtualization platform reduced server room power consumption by thirty five percent.
- Security Hardware was replaced with updated components and, where applicable, a redundant device was implemented.
- Monitoring Hardware was replaced with updated components and enhanced capacities.
- Switches and Router Hardware were replaced with updated components with some consolidation.
- Backup Devices were replaced with updated components, enhanced capacities, and redundancy added.
- Physical Preparedness: Racks were replaced and earthquake bracing was reconstructed into a motion cradle so it now free floats on ball bearings instead of depending on building structure for stability.

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- Environmental Preparedness: We replaced HVAC equipment, remote management, ducting and air handling, and redundant alerting systems to proactively avert repeat events. Additional power saving were obtained through this redesign.
  - Training and Knowledge Transfer: The drastic transition in a short time span from one to one physical server's to a shared physical server that houses a virtual server environment, requires training hours to bring city staff to an operational skill level to properly manage and administer these resources. This training will occur over the remainder of the 2013 calendar year.

Traffic Services Equipment

The Traffic Division of Public Works experienced the same July event and, as such, required all compromised equipment to be replaced. This was comprised of a few Physical Servers and many varied infrastructure components. These devices controlled intersection signals and cameras. All related equipment was defined and replaced with like for like when possible or upgraded if original equipment was no longer available. All Traffic equipment has been replaced, completed, and funded with the above mentioned insurance proceeds.

Final Expenditure Totals

Through the final phase of this project we have expended \$1,968,771 of the insurance proceeds. The remainder of proceeds, \$129,960, will be used for replacement of miscellaneous items related to the Data Center migration. We realize that some of the terminology used in this memo may not be common place, so we have attached a terminology glossary on the following page.

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**Terminology Glossary:**

- 1
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- 4 Physical Server - A name brand "Dell" corporate grade computer that provides
- 5 resources
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- 7 Virtual Server - A resource server that is provisioned in shared memory and not on
- 8 dedicated hardware.
- 9
- 10 RCW - The Revised Codes of Washington. – State mandated compliance
- 11 rules
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- 13 LMC - Lynnwood Municipal Code
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- 15 HIPAA - Health Insurance Portability and Accountability Act – Personal
- 16 Privacy rules
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- 18 PCI - Payment Card Industry – Rules for conducting Credit Card
- 19 Processing
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- 21 Snocom 911 - Emergency service provider and data collaboration partner
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- 23 CJIS - Criminal Justice Information Services – Rules for securing shared
- 24 Justice data
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- 26 HVAC - Heating, Ventilation, and Air Conditioning equipment.