



1Photo Seattle P-I

AFTER ACTION REPORT



January 16 – 20, 2012

SNOW and ICE

PRE-EVENT COORDINATION

On Friday, January 13, 2012 the Office of Emergency Management and various City department representatives participated in a National Weather Service (NWS) conference call forecasting snow for the weekend and following week. Seattle Department of Transportation (SDOT) scheduled a day shift for standby duty starting 5:00 a.m. Saturday morning, January 14, and all equipment was made ready before crews left for the day Friday afternoon. Several inches of lowland snow fell on the metropolitan area Sunday, January 15.

The Office of Emergency Management (OEM) in conjunction with Seattle Department of Transportation (SDOT) conducted a conference call Sunday afternoon to solidify the hours of Emergency Operations Center activation and develop a preliminary Consolidated Action Plan to focus the collective efforts of the City on several key objectives.

Consolidated Action Plan (CAP) Objectives

- ✓ Maintain situation awareness
- ✓ Support SDOT response operations
- ✓ Maintain essential law enforcement, fire, utility and healthcare services
- ✓ Closely monitor and address impacts to healthcare systems and services
- ✓ Closely monitor and address impacts to human services
- ✓ Provide timely and accurate information to the public and city employees

Press releases were issued in advance of the storm to remind people to be personally prepared and what to expect of City services. A key message that residential streets would not be plowed was put out early and often and media outlets were reiterating that message throughout the event. This strategy proved effective in managing public expectations. All press releases, Situation Reports and Snap Shot updates were jointly reviewed by the Emergency Operation Center (EOC) Director, the Plans Section Chief and the Joint Information Center (JIC) Supervisor to ensure consistency and accuracy.

EVENT OVERVIEW

The geography and climate of the Pacific Northwest make accurate predictions for snow difficult. When the City of Seattle is faced with the potential of snow, we rely on several sources for information. The primary being the National Weather Service (NWS) on Sand Point Way, additionally the City has two contract services – WeatherNet and AccuWeather, and utilizes UW Professor Cliff Mass' blog posts and e-mails. These forecasts help to inform planned storm response strategies.

Seattle began to see snow fall early Wednesday morning which continued throughout the day. On Wednesday afternoon another weather system came through the area, dropping additional snow, for a total accumulation of 3-9 inches. Weather forecasts were predicting moderating temperatures with snow turning to rain beginning on Thursday morning. While there had been some discussion about freezing rain during this transition, even the forecasters were surprised by the ice storm that began early Thursday morning. This unusual turn of events prompted NWS to issue an ice storm warning, which in turn, prompted the state to issue an Emergency Alert System warning for the region.

As expected, the snow accumulation created impacts to travel, business and service delivery as well as schools and government operations. The ensuing ice storm created difficulties throughout the region. Seattle was spared the worst of these, but still had to address the treacherous road conditions, power outages due to downed trees and power lines, and falling ice from high rise buildings throughout the downtown core.

The EOC activated Monday morning, January 16, at 7:00 a.m. and remained operational until 8:00 p.m. that evening. Because weather conditions did not warrant an overnight shift, the OEM Staff Duty Officer was the point of contact for any department in need of resources or coordination after the EOC shut down at 8:00 p.m. Beginning Tuesday, January 17, weather forecasters were predicting record-breaking snow fall, and the EOC went to 24-hour coverage and remained that way through demobilization on Friday, January 20, at 11:00 a.m.

The chart below captures a summary of EOC products including Consolidated Action Plans, daily Situation Reports, hourly Snap Shot updates, etc. A total of 347 shifts were filled in the EOC over the 5-day activation by various departments and agencies. The planning cycle used in the EOC was to set operational period objectives based on conditions and forecast, evaluate progress to the objectives, then adapt as necessary.

EOC Activity Summary

	Monday	Tuesday	Wednesday	Thursday	Friday	
	16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	Totals
Emergency Operation Center (EOC) Hours	0700 - 2000	0400 – 1800	0400 - 1800	0400 - 1800	0400 - 1100	
		1800 - 0600	1800 - 0600	1800 - 0600		
Consolidated Action Plan (CAP)	1	1	1	1	1	5
Situation Reports	1	2	2	2	1	8
Snap Shot Reports	12	10	10	10	3	45
EOC Briefings	3	4	4	3	2	16
NWS Conference Calls	1	1	1	1		5
King County (KC) Ice/ Snow Task Force Calls		2	2	1	1	6
KC Emergency Managers Calls		1	1	1	2	5

State Conference Calls			2		1	3
Emergency Executive Board Meetings	1	1	1	1	1	5
Advanced Planning Meeting			1	1		3
Seattle/King Co. Public Health Meeting				1		1
EOC Shifts Filled	31	80	95	85	56	347

Forecasters were predicting record accumulation of snow by Wednesday, January 18. Because of this, the City’s response garnered more than the average local media interest. Weather Channel and ABC News sent crews to cover the response, in addition to most local affiliates, running non-stop snow coverage for a couple days. The Mayor, scheduled to attend the U.S. Conference of Mayors in Washington, D.C., that week cancelled the trip and remained stationed at the EOC. He hosted numerous media interviews keeping the public apprised of progress on the city’s snow response, sharing public safety messages and reiterating the message regarding neighborhood streets not being plowed. He checked in continually with departments on their activities and met daily with his Emergency Executive Board (EEB). The EEB discussed current conditions, forecasts and planned actions, developed employee messaging, conducted outreach to distribution lists maintained by all City departments about safety messaging, tracked costs, and discussed whether the circumstances warranted an emergency proclamation or any other emergency measures.

Agencies represented in the EOC

- Seattle Department of Transportation (SDOT)
- Mayor’s Office (MO)
- Seattle Fire Department (SFD)
- Seattle Police Department (SPD)
- Office of Emergency Management (OEM)
- Auxiliary Communication Services (ACS)
- Seattle City Light (SCL)
- Finance and Administrative Services (FAS)
- Human Services Department (HSD)
- Joint Information Center (JIC)
- Seattle Public Utilities (SPU)
- Seattle Public Schools (SPS)
- Department of Information Technology (DoIT)
- Public Health Seattle & King County (PHSKC)
- Department of Parks and Recreation (DPR)
- King County Emergency Management Liaison
- Department of Planning and Development (DPD)
- Office of Housing (OH)
- Department of Neighborhoods (DON)
- 2-1-1 (Human Service Information and Referral)



2: Infrastructure Table at work

Seattle Department of Transportation RESPONSE

SDOT followed its Winter Weather Readiness and Response Plan over the weekend, January 14 and 15, and began 24-hour operations the evening of January 14, remaining on 12-hour/around-the-clock shifts through Saturday, January 21. The service level goals of the plan were:

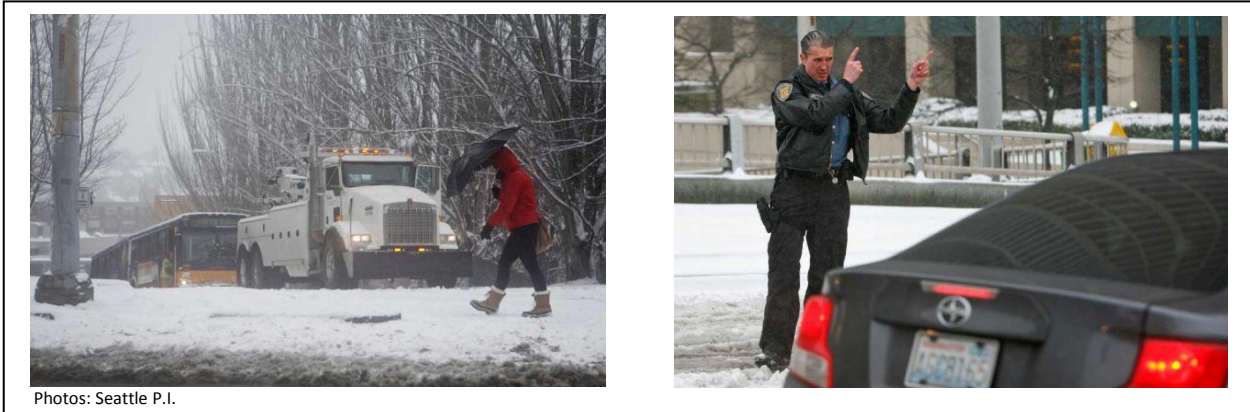
- Service Level 1: Bare pavement within 12 hours over all lanes on the most critical arterials as soon as there is a significant lull in the storm.
- Service Level 2: Bare pavement within 12 hours for one lane in each direction on selected major arterials and remaining Metro winter storm bus routes as soon as there is a significant lull in the storm.
- Service Level 3: Treat to deice hills, curves, bridges and controlled intersections as soon as there is a significant lull in the storm.

There are 946 lane-miles in this plan. The fleet of snow removal equipment includes 20 trucks that have spreaders and plows and 10 trucks that have plows only. In order to achieve the targeted service levels on major arterials, bus routes, and hospital access, SDOT does not plow residential streets.

SDOT met Service Level 1, as described above, at the end of the weekend and twice during the series of storms – the first being Thursday morning, January 19, prior to the freezing rain and, after making some operational changes, again for the Friday morning commute. Mid-Mountain, contracted following the 2010 snow storms to provide additional plowing, staged equipment at the Charles Street yard Monday evening based on the forecast. Their 3 road graders were not used until Thursday when the ice storm compounded the impacts of accumulating snow. They operated for approximately 16 hours Thursday afternoon through Friday morning.

The anti-icing magnesium chloride (MgCl) was effective at melting snow and improved the effectiveness of plowing. This was another change from the 2010 storm when sodium chloride did not prove as effective because of the sudden temperature drops. In total, 55,353 gallons of MgCl were applied, 3,373 tons of rock salt were used, and 5,015 labor hours were clocked. Seattle Public Utilities (SPU) and Parks Department drivers with commercial drivers licenses, who were cross trained in plow operations last year, were called to supplement SDOT plow drivers and helped maintain the tempo of the operation by delivering the rock salt to where SDOT needed it.

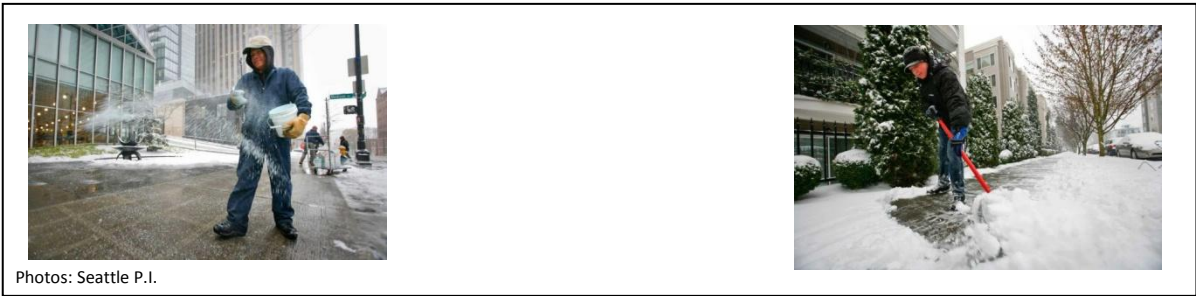
Communications between plow operators, dispatchers, and supervisory staff were greatly improved over the 2008 snowstorm. Representatives from KC Metro and the Seattle Police Department (SPD) worked alongside SDOT managers in SDOT's Tactical Operations Center at Charles Street to jointly solve problems and agree to priorities. By week's end, SDOT had responded to over 100 emergency calls from KC Metro, SPD and SFD. It is worth noting that each emergency call pulls a plow off its scheduled route and can delay meeting that plows' portion of the service level goals by several hours. Approximately 22 street segments were closed during the storm. These were primarily streets that, due to their steep grade, could not be cleared. "Street Closed" signs were staged at known trouble spots. The status of those closures was monitored and information shared between SDOT, SPD and Metro via a SharePoint site. SDOT was responsive to specific requests to address transit traffic, for instance, changing the signal timing at 3rd and Yesler to keep traffic flowing.



Some new tools in use during this storm were SDOT's Winter Weather Response Map that depicts established arterial service levels and where plows have recently completed plow runs. The online Weather Map was so popular that SPU had to put it on isolated server to accommodate heavy traffic. Also available for public viewing were the many street cameras throughout the City. Snow Watch, a service partnership between SDOT, SPU and the University of Washington provided real-time temperatures and short term forecasts. Although there are only two ground sensors currently installed, one in Bothell at I-405 and another in Tukwila near Interstate-5 and 405, SDOT has received budget authority to install 7 or 8 additional ground sensors on elevated structures within the City that will provide even better awareness of real-time field conditions in the future.

Included in SDOT's Winter Weather Readiness and Response Plan is the planning assumption that if accumulations of 12 inches of snow are possible, plowing would switch from pushing snow to the right to pushing it to the street center - at least in the Downtown area. This makes snow removal with front-end loaders and trucks possible. Because of the forecast, early in the week SDOT had identified resources to assist with removing the accumulated snow, as well as locations for dumping the snow. Because the amount of snow did not reach this threshold, the plan was never initiated.

Throughout the storm, SDOT dispatched 22 pedestrian crews to Downtown and various business districts to apply deicer and shovel the snow and ice from over 2,000 prioritized sidewalk landings and public stairs. Messages were shared through news releases and direct phone calls to business organizations reminding private property owners that it was their responsibility to clear their own sidewalks.



Service Impacts and General Operations

On Tuesday, January 17, King County Metro announced reduced service levels (30% fewer runs) on their regular snow routes for Wednesday and remained at that capacity through the Friday morning commute. Greyhound cancelled all routes over Snoqualmie Pass.

Food banks were open and libraries and neighborhood service centers were all operating on normal schedules. On Tuesday, Seattle Public Schools cancelled pre-school and Head Start programs and announced a 2-hour early release. They cancelled all programs Wednesday through Friday.

Aging and Disability Services (ADS) and home care agencies contacted their most high-risk clients to check on their welfare. Home delivered meals were rescheduled, with many extra deliveries offered pre-storm. The EOC Planning Section maintained contact with the 9-1-1 Communication Center, the Fire Alarm Center, the Customer Service Bureau, and 2-1-1 to monitor type and severity of calls. This was in addition to the on-going dialogue with representatives of the City departments working in the EOC (listed above) and monitoring of television news and blog reports.

On January 17, SFD, in anticipation of the snow storm, added 2 reserve aid units staffed by off-shift firefighters/EMTs. The reserve units were located at Station 2 in Belltown and Station 17 in the University District to help maintain quick response times plus to avoid having the large ladder trucks responding on icy roads to basic life support calls. The additional units were staffed through 8:00 a.m. on January 19. On the 18th, an additional Medic unit was put in service to cover West Seattle and remained in service January 20th.

The City's Auxiliary Communication Services team (ACS) – a group of more than 125 amateur radio volunteers - staffed the Communications Branch in the EOC and provided the City with real-time field conditions from various areas of the City.

SCL power outages peaked at about 6,500 customers without power on Wednesday and again on Thursday. Every individual outage was restored within 18 hours, usually much less. A 100% restoration level was achieved several times, but each storm front caused a few more outages.

The EOC Logistics Section reminded departments to monitor consumables (e.g., tire chains) and notify them immediately if shortages appeared likely. Finance and Administrative Services Department (FAS) Fleet Service crews were on duty 24 hours throughout the week to support SDOT with chains, equipment maintenance and other ancillary services. Prior to the event, FAS Fleet Services topped off all city fuel tanks and monitored fuel supplies throughout the storm.

The EOC Health and Human Services Branch kept the City apprised of the status of human service program operations including winter weather shelters for people who are homeless. Because of the severe weather conditions, an emergency weather shelter was also opened at the Seattle Center. The Human Services Department arranged for The Salvation Army to open the City Hall shelter one hour earlier Tuesday through Monday, and for the Compass Day Center to open four hours early at 6:30 am.

SPD operated its cold weather outreach wagon each night contacting homeless individuals, directing them to shelters, offering rides, and distributing blankets, water, socks, etc. Though 30 - 50 contacts were made each evening, only a small handful of individuals accepted the ride, but many appreciated the supplies. Winter weather shelter client counts were:

Client Count

WINTER WEATHER SHELTERS	Winter Weather Shelters (Oct 1 – Mar 31)		Emergency Weather Shelter	Total Shelter Clients	Extended Hours (+ 4 hrs/day)
	City Hall (co-ed)	Frye Hotel (women)	Seattle Center (co-ed)		Compass Day Center (co-ed)
Sunday, January 15	75	33	24	132	62
Monday, January 16	75	41	44	160	75
Tuesday, January 17	76	35	47	158	66
Wednesday, January 18	75	40	41	155	83
Thursday, January 19	75	42	67	184	72

Between Tuesday and Friday, King County 2-1-1 Information and Referral Specialists responded to a total of 107 calls related to power outages (49), snow (41), storm/ice/wind (17). This represented 10% of all incoming calls. The 24-hour King County Crisis Clinic handled 37 calls related to the storm and 39 related to emergency shelter which was higher than normal. 2-1-1 was able to refer callers to local emergency services.

PHSKC activated the Health and Medical Area Command and implemented an aggressive carbon monoxide poisoning prevention campaign. They also coordinated the transportation of patients to critical medical appointments like dialysis, assessed the status and needs of nursing homes and boarding homes, provided resources and information to hospitals and healthcare facilities affected by the storm, and provided weather safety information to its Community Communications Network of more than 300 community based organizations, many serving vulnerable populations.

On Wednesday, January 18, garbage, yard waste and recycling collection were postponed. Seattle Public Library reported the need to close the 4th Avenue sidewalk as sheets of snow fell from the building. SPU cleared priority roads, gates and main office area at the Cedar River Watershed and the road to the treatment plant for chemical delivery to the Tolt Watershed. Parks community centers that were open in the morning, closed at 1:30 p.m. Greyhound cancelled all schedules after 2:00 p.m. Hospitals reported normal operations and all Northwest Kidney Center facilities ran on normal schedules. Puget Sound Blood Center maintained a stable supply but planned a public appeal to donate the following day.

Also on Wednesday, when a private ambulance company struggled with traction on some steep downtown streets on their way to First Hill hospitals, SDOT worked with SFD, SPD and PHSKC to design alternate access routes and communicated that plan to all regional EMS partners and private ambulance companies. That plan remained in place throughout Wednesday and Thursday. HSD also worked with Senior Housing Assistance Program to share similar information.

By 8:00 a.m. January 19, streets throughout the City were being coated with a layer of freezing rain. An ice storm warning was issued and then extended by the NWS through 2:00 p.m. Though the application of rock salt generally kept the main arterials passable, residential streets became particularly treacherous due to the freezing rain on top of packed snow.

All libraries and community centers were closed and SPU cancelled garbage, yard waste and recycling collection. Neighborhood Service Centers were open. Department of Social and Health Services (DSHS) Community Services offices were closed. HSD contacted homeless providers regarding their status and options where people could go to get warm. Day shelters saw more people than usual. ADS made calls to high risk clients and reported no problems. Home care agencies continued serving clients.

SFD responded to 3 carbon monoxide alarms between 7:00 p.m. January 18 and 7:00 a.m. January 19. Patients were evaluated and none required treatment or transport.

City department directors were encouraged by the Mayor's Office to work with supervisors and employees to balance employee safety with the delivery of essential services.

The Office of Economic Development (OED) contacted the Building Owners and Management Association and Downtown Seattle Association requesting they advise their membership to spread salt, shovel snow and otherwise treat sidewalks as well as take measures to protect pedestrians from ice falling from high-rises. The EOC also requested Washington First Coalition (major banks and financial institutions) to similarly encourage their membership to help.

The SPU customer call center had 22 agents available to take customer calls for power outage or utility concerns, and stayed open all night.

Partnerships and Coordination

King County Office of Emergency Management (KCOEM) activated the Lowland Snow & Ice Task Force dedicated to addressing the problem of stranded Metro coaches.

KCOEM hosted conference calls daily to coordinate information and resource requests among cities. Washington State Emergency Management Division provided a similar service for impacted counties.

The Seattle EOC remained in close contact throughout the week with the Seattle Public Schools, University of Washington, Health and Medical Area Command, Washington First Coalition, Sound Transit, Amtrak, Greyhound, SeaTac Airport, King County Metro, and a variety of Emergency Support

Function-6 human service agencies. The Seattle Commission for People with Disabilities shared safety messages and progress reports with their distribution lists.

The Mayor’s Council Liaison maintained contact with the City Council, sharing 45 e-mails and phone calls and receiving 12 incoming e-mails and phones calls. Topics ranged from city shelters and pet policy, to employee safety, sidewalk maintenance, field operations, and road conditions. These were in addition to the daily Situation Reports and hourly Snap Shot reports shared directly with the Council.

Public Information/Media

The JIC was staffed by Public Information Officers (PIO) from various City Departments and the Mayor’s Office. Their messages proactively sought the public’s assistance in avoiding discretionary travel, treating privately owned sidewalks, preventing sledding injuries and carbon monoxide poisoning, etc. The JIC, with the support of the Mayor’s Office Communications Team, was incredibly active during and before the five-day snowstorm activation using news releases, social media, the city’s website and interviews with media to help communicate safety messages during the snow event. The chart below reflects an overview of what was produced during the activation. Please note, the actual media inquiries are estimated to be approximately 30% higher. The JIC received more phone calls than were logged and is putting better tracking procedures into place for the future.

Media Activity

Media/Tactic	Number	Notes
News releases	16	During the activation including opening and closing.
Media calls	164	This number is an estimate.
Customer Service Bureau Calls	621	Jan 16-19, 2012
Seattle.gov home views	+ 59%	Increase in traffic from average (users)
Winter map from SDOT	+158%	Increase in traffic from average (users)
Winter weather page from SDOT	+ 451%	Increase in traffic from average (users)
Seattle Channel video views	2,395	Views of McGinn preparedness videos
@CityofSeattle tweets	107	Re-tweeted 311 times. Added 450 followers.
@seattlecitylight	55	Re-tweeted 60 times. Added 100 followers.
Blog posts	20	From McGinn, SDOT, SPU, City Light

In addition to the above chart, the JIC, with the support of the City Wide Web Team, deployed new technology tools including:

- Seattle.gov home page alert box, updated several times a day
- Department page alert box, updated several times a day

- Widget for the public to deploy (updated one time per day as needed) which allowed for websites with the widget to be updated automatically.

These tools were added to help support consistent, current messages from the city, regardless of the entry point of customers. In addition, twitter was extensively used in the JIC and by several departments and the Mayor. Our traditional media partners, community journalists and the public extensively re-tweeted our messages.

JIC maintained a listing of city and other facility closures and limited operations including neighborhood service centers, the Animal Shelter, inspection stations, parks, neighborhood programs, Municipal Court, Southwest Youth and Family Services, Salvation Army, Cathedral Kitchen, Food Lifeline, Northwest Harvest, etc. The Health and Human Services Branch provided continuous updates to the JIC and the EOC Planning Section on the status of these organizations and others, such as Catholic Community Services, DSHS offices, senior centers and child care centers.

The city's web page was switched to 'emergency' mode whereby the primary landing page is focused almost exclusively on storm-related information from all city departments. A web manager was constantly available in the JIC to post new information.

On Friday, January 20 the focus shifted to clearing as many of the City's 80,000 storm drains as possible to prevent major flooding. As the series of storms throughout the week subsided, the City remained watchful as the soil saturation conditions reported by the United States Geological Survey crossed the threshold on Friday evening, increasing the risk of landslides along with prediction of high winds for Sunday, January 22.

The website for Seattle Department of Transportation had increased traffic during the storm going from an average of 125,000 site visits per week to 445,000 during the week of the snow response.

Assistance to Neighboring Jurisdictions

Seattle's neighboring cities and counties absorbed a greater brunt of the snow, ice and wind storms and therefore by week's end Seattle was able to loan some personnel and equipment to others in the region in greater need. For example,

- Two SCL crews were dispatched to Puget Sound Energy; each crew consisted of 5 team members and 3 vehicles. A supervisor for the crews also was sent anticipating that 2 more crews might be sent later.
- A high-capacity generator was loaned by the Parks Department to King County for back-up power to cell towers in the Cascade foothills to support 9-1-1 services.
- Three staff members volunteered to work the King County ECC, but were not needed.
- One staff person volunteered to work Health and Medical Area Command but was not needed.
- One JIC Supervisor volunteered to work the King County JIC, but was not needed.
- The Seattle Metro Incident Management Team volunteered, but was not needed.
- SDOT loaned a 9" chipper to the City of Auburn to assist in their debris clearance operations.

Analysis of Past Improvement Plans

The After Action Reports and Improvement Plans from the storms of 2008 and 2010 were reviewed by the Seattle OEM prior to the storm and again after the storm to make sure that past problems did not recur. The Emergency Manager from the City of Baltimore also spontaneously shared a copy of his After Action Report from a much more severe storm and lessons they had learned. The Advanced Planning Unit within the EOC studied this plan for further ideas as well. The primary recurring issue has to do with the naming convention used to describe service level usability of the streets in SDOT's Winter Weather Plan. As noted on page 4 of this report "Level 1" refers to a higher number of lanes serviced through plowing or sanding, not the priority of the route. SDOT will revisit this issue.

Costs

Preliminary storm related costs are estimated by SDOT at \$1.35 million with an additional \$180,000 for overtime and supply costs from various City Departments.

Things That Worked Well

There were many successes in the EOC that reflected past lessons and on-going training and readiness. They include:

- Use of social media
- Daily Situation and hourly Snap Shot reports
- City conference calls for sharing National Weather Service forecasts
- Sharing National Weather Service briefing notes
- The extensive preparations SDOT made to increase their capability for winter storm response
- Coordination among City Departments, external agencies like Metro and private ambulance companies, and the Joint Information Center
- Adding tasking and filtering features added to the WebEOC information management tool
- Support in the EOC by the Department of Information Technology
- Supplemental staffing from Police Headquarters and SPU in the EOC Plans and Administration Sections
- Focus on and evaluation of objective-oriented missions in general

Based on lessons learned from past storms, more emphasis was placed on the advanced planning function in the EOC throughout the storm response. This allowed for concentrated efforts to be devoted to looking ahead to potential twists and turns and to begin considering how we would respond to them. Over the course of the week a variety of contingencies were planned for:

- Department of Planning and Development (DPD) planned for potential roof collapses caused by snow and ice accumulations
- SPU planned ahead for potential flooding based on rapid snow melt mixed with rain
- SCL staffed up for potential power outages caused by falling trees weighted down by snow and ice
- DoIT prepared to increase the number of Virtual Private Network (VPN) connections from 200 to 2,000 to accommodate more city employees working virtually from home

- PHSKC planned for transport for critical dialysis patients
- Seattle-EOC Health and Human Services Branch planned for mass care and sheltering should significant numbers of SCL customers lose power for sustained periods of time

Many departments planned for program cancellations or interruptions to service including, Parks, Department of Neighborhoods (DON), SPU, Seattle Center, etc.

SDOT's new web-based map showing where plows had been and the traffic cameras helped people make informed decisions about travel and demonstrated the City's progress toward service levels.

SCL's web page displayed where power outages had been reported, customers impacted, diagnosis of the problem, and estimated time of restoration.

Things That Could be Improved

Every activation provides the City an opportunity test its plans, protocols and tools and achieve higher levels of proficiency. The attached Improvement Plan documents what problems were encountered, what should be done to correct them, who is responsible, and when the problem is expected to be resolved.

The After Action Report and Improvement Plan have been created as soon as possible, following the event, in order to quickly capture and act on Lessons Learned.