

RAPID RESPONSE VEHICLE (RRV) BUDGET NOTE REPORT

This report to City Council is in response to the following budget note included in the FY 2013-14 Adopted Budget:

Rapid Response Vehicle Analysis and Use

Council directs Portland Fire & Rescue to work with Multnomah County Emergency Medical Services and the Bureau of Emergency Communications to develop additional new triage protocols for medical incidents so that Rapid Response Vehicle units can respond to a greater number of medical incidents. In addition, the bureau will regularly collect and analyze data on Rapid Response Vehicle usage, including what types of incidents are responded to and the savings achieved by responding with the units instead of engines and trucks. The bureau will report back to Council by January 1, 2014.

EXECUTIVE SUMMARY

Over the past 30 years, as urban areas have become increasingly dense and demands on public services have escalated, fire & rescue departments in the U.S. have created efficiencies to taxpayers by using existing 24/7 fire & rescue resources to respond to medical emergencies.

The RRV program, with its focus on lower-acuity healthcare calls, is a modification of the design recommendation by TriData in 2011. The program has had some success in freeing up our four-person crews and apparatus so they can focus on the majority of the bureau's calls, which are critical fire & rescue dispatches. Use of RRVs can save the bureau money, although it is minimal because lower-acuity calls are a small percentage of PF&R's responses. While it remains to be seen how the Affordable Healthcare Act will influence lower-acuity calls (they could conceivably decrease with tele-medicine, etc.), PF&R is actively looking for ways to turn this new legislation into an opportunity. Through the pilot program we learned:

- We need to expand the RRV call response times from 15 to 20 minutes in order to make them most effective.
- Relocation of one RRV from Downtown to North Portland is a more efficient placement of this type of vehicle.
- Careful assessment and assignment of call types is important for public safety, patient care, and overall success of the RRV program.
- The addition of RRVs 24/7 to high volume stations shows greater improvement to response reliability over 40 hour schedule.

PROGRAM BACKGROUND

Approximately 93% of PF&R emergency calls require a minimum of four firefighters and a wide complement of tools. This includes calls where critical interventions need to be delivered in *parallel* rather than *serial* order (fire, rescue and EMS calls)

Through triage, the Bureau of Emergency Communications (BOEC) determines if the patient requires a time critical intervention (six-person team, lights and sirens) or if the issue can generally be resolved with a two-person team traveling Code 1 (no lights and sirens because longer response is acceptable). Originally estimated at 10% of all calls, the Rapid Response Vehicle Program was designed to respond to these non-emergency Type 9 calls; actual data analysis shows lower-acuity (or 'Type 9' in dispatch code) calls account for approximately 5,000 responses per year, or 7% of calls dispatched.

In April 2012, the program received one-time funding for two RRVs to be in service 40 hours a week. This service created a change in working conditions that required a MOU with Local 43 and resulted in firefighters staffing RRVs M-Th 0800-1800. The RRV program has consistently been an effort to:

- Improve response reliability and response times for critical fire and emergency response apparatus
- Reduce mileage, therefore wear and tear, on more expensive apparatus.
- Save fuel, maintenance, and replacement costs.

While the RRVs are not capable of performing critical fire & rescue interventions and do not help to maintain Portland's ISO or other fire protection ratings, they are an effective way to improve response reliability of critical fire apparatus.

INITIAL PROGRAM CHALLENGES & ENHANCEMENTS

While assigned only 40 hours a week, the RRVs did begin to help improve apparatus response reliability of four-person crews to higher priority calls by taking the lower priority Type 9 calls (see Data Sets section below). However, with the total number of calls accounting for approximately 7.2% of all calls city-wide, PF&R was concerned that deploying RRVs exclusively to lower-acuity Type 9 calls would have minimal impact on response reliability.

Based on Councils directive and PF&R's desire to ensure that the RRV program achieved its goals of improving response reliability and response time of critical fire & rescue crews, PF&R worked with the Multnomah County EMS (MCEMS) Medical Director to evaluate response criteria, including triage and dispatch cards. Through this process, PF&R and the MCEMS Medical Director identified several emergency type codes for RRV response in their first-in area presumed not to require Advanced Life Support measures, specialized equipment, or additional services (such as heavy lifting, carrying requiring additional people, or scene security).

NEW TRIAGE PROTOCOLS

RRV Non-Emergency Response Times Extended

PF&R data shows that when a four-person Engine, Truck or Quint responds to a lower-acuity call in high-volume areas, the apparatus is unavailable for high-priority, critical fire & rescue responses. The RRVs were designed to address this problem by relieving Engines, Trucks, or Quints of lower-acuity calls to improve their availability for critical responses.

When the four RRVs began 24/7 coverage, they were dispatched on all lower-acuity calls across the city. Incident routing uses GPS location to dispatch the RRV closest to the address of the call. Based on their distance from the scene and traffic conditions, crews would then estimate if they could arrive within 15 minutes. When RRV crews determined they could not arrive within 15 minutes, they would send the call back to dispatch.

PF&R data shows that RRV crews have deferred approximately 42 Type 9 calls per month due to their inability to arrive within the 15 minute timeframe. To put this into context, there were 5,083 Type 9 responses over the past 12 months. Yet due to the 15 minute response window, the RRVs respond to only around 60% of these lower-priority, Type 9 calls. In short, the 15 minute protocol does not allow the RRVs to be used most efficiently because every lower-acuity Type 9 call that the RRV crews decline then requires intervention by a four-person crew capable of responding to critical emergencies.

For Portland's system, it is more efficient for the RRVs to take a little longer and respond to the lower-acuity Type 9 calls to ensure that 4-person crews are available for critical emergency interventions. To do this, PF&R has worked with BOEC to expand the 15 minute response window to 20 minutes. In November 2013, all four RRVs began responding to lower-acuity Type 9 calls city-wide when crews estimate they can arrive on scene within 20 minutes.

RRV Emergency Call Types Adjusted

Another unintended consequence discovered since the RRVs began 24/7 coverage is that some of the Type 3 emergency call types approved for RRV response frequently required more resources and capabilities than the RRVs can provide.

After analyzing patient outcomes, PF&R worked with the MCEMS Medical Director and BOEC to reassign RRV responses to four Type 3 emergency call types that have consistently required additional resources from four-person crews (these include the Trauma, Overdose, Obstetric, and Assault dispatches). This reduction in RRV Type 3 dispatches is a small percentage of the overall RRV responses and will create efficiency by:

- Improving patient care outcomes by having adequate resources arrive in a timely manner.
- Utilizing fewer resources by dispatching one unit instead of sending two units (one inadequately staffed, the other providing additional needed resources).

These changes are expected to further enhance the response reliability of critical emergency apparatus. However, as triage improves and healthcare changes, the use of lower acuity RRV resources may be increased.

Other Adjustments

PF&R is currently evaluating a Response Analysis to determine if relocating RRV 1 from Station 1 at 55 SW Ash to Station 24 at North Maryland and Going will further improve the program by enhancing our ability to respond to calls in both North Portland and Downtown. Based on drive tests and Google Maps, PF&R believes it can improve RRV responses to lower-acuity calls. PF&R also believes that this move can increase its city-wide Type 9 responses from 60% to at least 85%.

PF&R is also working closely with BOEC to refine 9-1-1 dispatch question cards to better determine whether patient lifting requires more than a two-person crew. Calls for heavy patient lifting will then be dispatched to four-person crews instead of to an RRV that needs to request additional help, taking two units out of service instead of one.

DATA SETS

Response Volume

Table 1 presents the RRV response volume since the four vehicles began operating 24/7 in July 2013.

Table 1 – Response Volume

Unit	Jul-13	Aug-13	Sep-13	Oct-13	Total
RRV 1	230	305	372	317	1224
RRV 7	238	249	187	195	869
RRV 11	175	185	168	166	694
RRV 19	158	189	188	177	712
TOTAL	801	928	915	855	3499
Average Response Per Day	29.7	29.9	30.5	27.6	29.4

While RRV 1 of Station 1 has the highest response volume of all RRV units, it is important to note that it has the highest number of cancellations due to their inability to reach calls into North Portland within 15 minutes. The new 20-minute response protocol and the relocation of RRV 1 to Station 24 should significantly decrease such cancellations.

Call Types

Table 2 shows that Public Assistance calls are currently the most frequent RRV call type. PF&R has worked with BOEC to refine dispatch card questions on Public Assistance calls to better determine whether patient lifting requires more than two firefighters.

Back injuries from patient lifting are the #1 cause of time loss injuries at PF&R. When a heavy patient requires lifting, it is more effective to send a Truck, Engine, or Quint than it

is to dispatch an RRV crew that will later need additional help. Eliminating RRV heavy patient responses is expected to further enhance the response reliability of critical emergency apparatus.

Table 2 – Most Frequent Calls For Service

Call Type	Jul-13	Aug-13	Sep-13	Oct-13	Total
Public Assist	133	174	176	187	670
Trauma	150	137	167	155	609
Sick	97	108	134	132	471
Abdominal	48	47	19	57	171
TOTAL	428	466	496	531	1921

Response Reliability

Table 3 presents the RRV program's impact on response reliability. All four stations have improved since the implementation of 24/7 coverage in July 2013 when compared to the previous fiscal year. Also note that the two 40-hour RRVs funded during the 2012 Pilot Program (RRV 11 and RRV 19) improved response reliability when compared to when PF&R had no rescues (FY2006-07).

Table 3 – Response Reliability Impact

Unit	No RRVs 7/2006-6/2007	Last Fiscal Year 7/2012-6/2013	Current 7/2013-11/2013
Station 1	93.8%	96.4%	96.8%
Station 7	n/a*	95.4%	97.9%
Station 11	85.9%	88.9%	94.1%
Station 19	85.9%	91.1%	93.6%

**A third apparatus operated out Station 7 during the Bond funded remodel of Station 30.*

Response Times

Table 4 shows RRV response times. While a typical measure of fire & rescue operational efficiency is how quickly crews respond on scene, the opposite is true for the RRVs. We anticipate the new 20 minute travel time protocol will increase all RRV response times. However, an increase in RRV response times will indicate that they are achieving their objective of taking on a larger share of lower-acuity calls that do not require a four person crew or emergency medical intervention (lights and sirens).

Table 4 – RRV Response Times (7/1/13-11/27/13)

Unit	Response Time at 90th Percentile
RRV 1	11:58
RRV 7	9:49
RRV 11	10:22
RRV 19	11:48

Miles Traveled & Cost Savings Estimates

Table 5 presents the miles traveled by the RRVs, along with the mileage savings of the first-due apparatus that would have responded, since putting them into service 24/7.

Table 5 – Miles Traveled

	RRV 1	RRV 7	RRV 11	RRV 19	TOTAL
Jul-13	422	318	465	319	1524
Aug-13	962	754	501	604	2821
Sep-13	564	581	565	535	2245
Oct-13	624	490	430	430	1974
TOTAL MILES	2572	2142	1962	1888	8564
	Miles Offset	Miles Offset	Miles Offset	Miles Offset	TOTAL
Jul-13	126	51	53	47	275
Aug-13	174	60	75	47	356
Sep-13	132	38	91	120	381
Oct-13	138	48	25	68	279
TOTAL MILES	569	197	244	281	1291

Table 6 presents rough cost per mile estimates for RRVs, Engines and Trucks. (Note: cost per mile for the Quints is the same as the cost of running Trucks.)

Table 6 – Cost Per Mile Estimates

	Gas Mileage	Gas/Diesel Price	Fuel Cost per Mile	Maintenance/Repair Cost per Mile	Replacement Cost per Mile	Total Cost per Mile
RRV	16	\$3.30	\$0.21	\$0.32	\$0.50	\$1.03
Engine	3.5	\$3.90	\$1.11	\$1.86	\$4.00	\$6.97
Truck	2.5	\$3.90	\$1.56	\$3.78	\$7.38	\$12.73
Engine (30) Truck (9) Blended Rate						\$8.30

While the RRVs are traveling greater distances than the closest unit would have travelled to the same calls, the overall carbon footprint of our responses is reduced. More importantly, each community receives greater response reliability from the critical fire & rescue apparatus in their neighborhood.

In multiplying the \$1.03 Total Cost per Mile to run an RRV by the 8,564 miles traveled by all four RRVs from July thru October (see Table 5), we estimate that the RRVs cost \$8,821 over the four-month period. If there were no RRVs, first-due apparatus would have traveled approximately 1,291 miles to respond to those calls, resulting in an apparatus cost (fuel, maintenance and replacement) of approximately \$10,715 (1,291 miles x \$8.30 per mile). As a result, the net apparatus cost savings from all four RRVs is estimated to be around \$1,894 over four months, or \$5,683 per year. Table 7 shows the cost savings per RRV.

Table 7 – Program Savings Per RRV

	RRV Cost	Apparatus Savings	Program Savings
RRV 1	(\$2,649)	\$4,723	\$2,074
RRV 7	(\$2,206)	\$1,635	(\$571)
RRV 11	(\$2,021)	\$2,025	\$4
RRV 19	(\$1,945)	\$2,332	\$388

Total Savings
\$1,894

CONCLUSION

The RRV Program was designed to alleviate fire & rescue apparatus from responding to lower priority, non-emergency calls. While the RRVs are not capable of performing critical fire & rescue interventions and do not help to maintain Portland's ISO or other fire protection ratings, they can be an effective way to improve response reliability of critical fire apparatus when used to supplement four-person emergency response crews.

While replacing more four-person crews with additional RRVs would weaken aspects of our emergency response system, PF&R believes the RRV program as currently configured is improving response reliability of critical fire & rescue apparatus in neighborhoods with poor response reliability. Working with both the Multnomah County EMS Medical Director and BOEC, PF&R has implemented the following to further improve medical responses throughout our city.

- Reassigned higher priority Type 3 calls to critical fire & rescue apparatus for improved patient outcomes.
- Determined patient weights prior to dispatch to maximize in-service resources available and reduce lifting injuries (awaiting final implementation from BOEC).
- Expanded response time window from 15 to 20 minute response to capture greater percentage of Type 9 calls city-wide.
- Conducted a Drive Analysis to evaluate if relocating RRV 1 from Downtown to North Portland will capture a greater number of calls and address new response reliability issues
- Developed Available On-Scene protocol for critical 4-person apparatus to clear from calls while still on-scene and be available to respond to additional critical calls in their first-in area.

PF&R believes these latest reforms will enable the RRVs to respond to a greater number of the lower-acuity calls they were designed to respond to, which in turn will improve our city-wide response reliability to higher acuity calls.