



Wapello County EMS Advisory Council

EMSAC · SYSTEM PLANNING DOCUMENT — MEDICAL CALL CAPACITY & THIRD AMBULANCE PLANNING

Medical Call Hourly Capacity Study

2024-2025 comprehensive analysis, with a 2026 year-to-date addendum · Third ambulance / back-up crew planning · Wapello County / Ottumwa EMS

What this document contains

This edition combines two prior EMSAC deliverables into one reference document. Pages 2–25 are the original 2024-2025 Medical Call Hourly Capacity Study, unchanged from the version EMSAC previously reviewed, and include the two-year combined analysis followed by the standalone 2024 and 2025 annual reports. Pages 26–32 add a 2026 year-to-date addendum, layering five additional months of 2026 data (January 1 – May 26) onto the two-year findings to check whether the trend changes the recommendation.

Bottom line

The recommended primary coverage window — 09:00–18:59 — is unchanged and is now confirmed across three consecutive periods. The 2026 data increases the urgency of the case and identifies emerging weekend risk; see the addendum on page 26 for detail.

2024-2025 Medical Call Hourly Capacity Study

Two-Year Third Ambulance / Back-Up Crew Planning Recommendation

Prepared for EMSAC discussion, system planning, and policy development

Executive Summary

This comprehensive study combines the 2024 and 2025 medical call-hour datasets to determine whether the back-up crew recommendation remains stable or shifts when two full years of demand are reviewed together. Across the two-year period, the datasets include 731 days, 17,544 hourly demand slots, and 7,298 medical calls.

The two-year dataset contains 197 hour-slots with 3 or more medical calls. This represents 1.1% of all hours reviewed, but those are the specific hours where demand exceeded the normal two-ambulance planning baseline. Total excess demand above two ambulances was 225 call-units.

The combined two-year analysis does not support moving away from the 2024 recommendation. The 2025 data shifted slightly later in the day, but when both years are combined, 09:00-18:59 is the strongest 10-hour window overall. It captures more 3+ hour-slots and more excess call load than the 2025-only optimized 10:00-19:59 window.

Bottom line: the combined study supports using 09:00-18:59 as the primary planning window for a third ambulance/back-up crew, with 09:00-16:59 as the lower-cost 8-hour option and 09:00-20:59 as the preferred surge/on-call extension when feasible.

Primary two-year recommendation	Plan third ambulance/back-up crew availability from 09:00-18:59.
Lower-cost 8-hour option	Use 09:00-16:59 if the system can only support an 8-hour staffed or scheduled back-up block.
Surge/on-call extension	Use 09:00-20:59 as the preferred broader availability window when staffing, volunteer response, or on-call resources permit.
Recommendation stability	The 2025-only analysis shifted slightly later, but the two-year combined analysis returns the strongest 10-hour window to 09:00-18:59.
Weekday/weekend finding	Weekdays have a higher overload rate than weekends; weekend risk is lower overall but slightly more evening-sensitive.

Year-by-Year Summary

Study Year	Days	Total Calls	3+ Hour-Slots	% of Hours	Excess Above 2	Best 10-Hour Window
2024	366	3,729	107	1.2%	120	09:00-18:59
2025	365	3,569	90	1.0%	105	10:00-19:59
Combined	731	7,298	197	1.1%	225	09:00-18:59

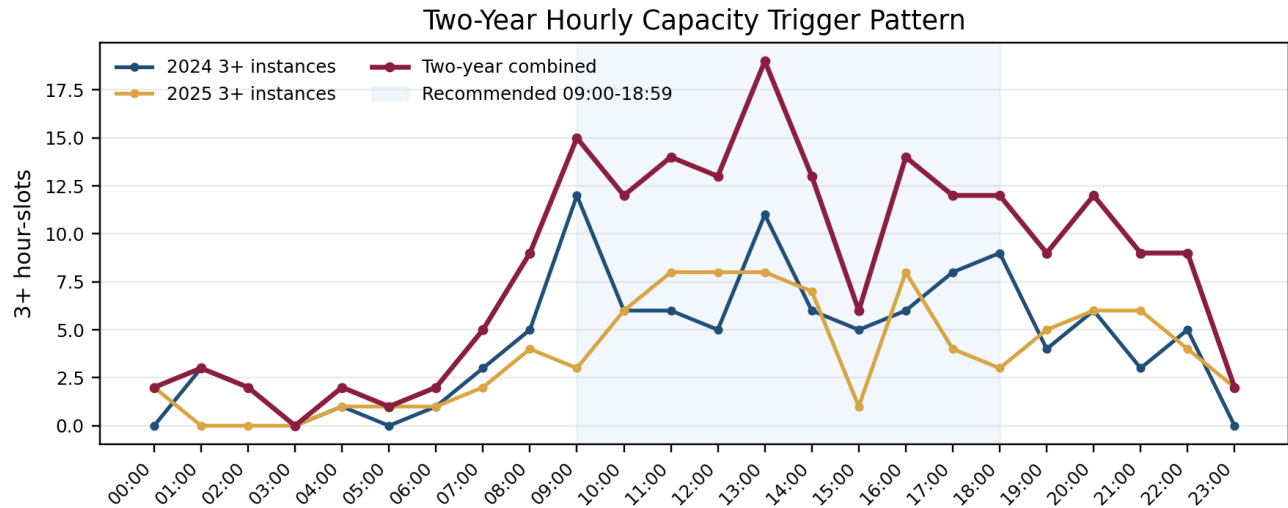
The annual call totals are similar enough that neither year appears to be an outlier. 2024 had more 3+ hour-slots and more excess call load, while 2025 showed a later daily pattern. The combined result favors the more stable daytime and early-evening window.

Planning Background and Methodology

This study uses hour-level medical call counts. Each date-hour combination is treated as one demand slot. A slot with 3 or more medical calls is a capacity trigger because the normal planning assumption is two ambulances available per hour. When a third medical call occurs in the same hour, the system may need a third unit, back-up crew, mutual aid, delayed response management, or another operational adjustment.

The analysis should be interpreted as a capacity planning tool, not as a minute-by-minute simultaneous call audit. Actual strain depends on call duration, transport time, hospital turnaround, geography, out-of-area transfers, crew status, staffing levels, and whether one or two ambulances were actually available at the time.

Because local availability is sometimes less than two ambulances, the study also includes a one-unit sensitivity review.



Combined Two-Year Findings

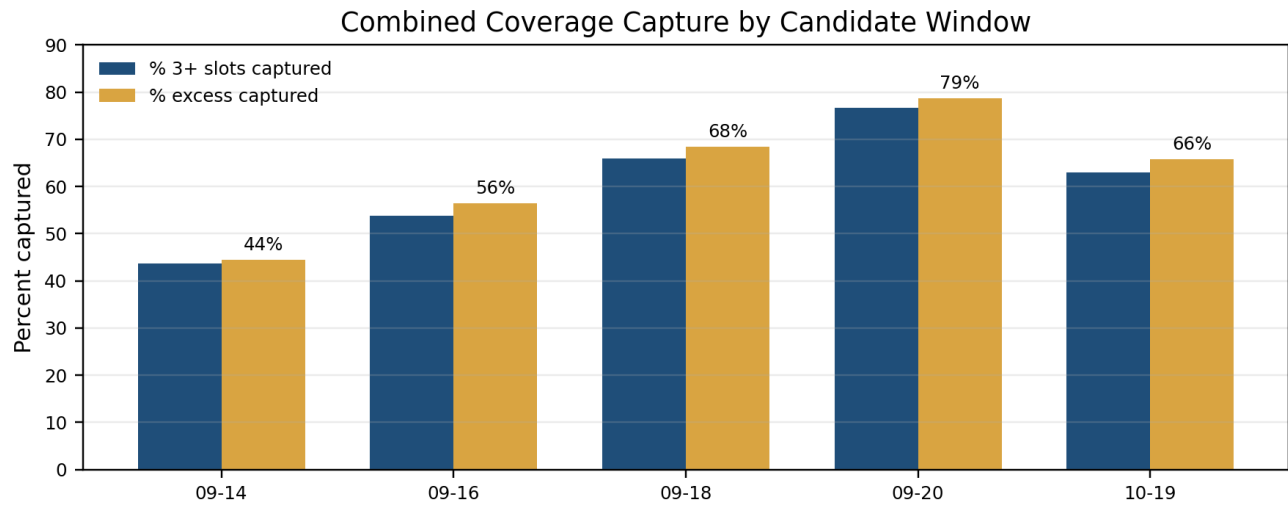
Across 2024 and 2025 combined, the strongest individual overload hours are concentrated between 09:00 and 20:59, with the highest recurring pressure in the late morning, midday, afternoon, and early evening. The strongest individual hour was 13:00-13:59, followed by 09:00-09:59, 11:00-11:59, and 16:00-16:59.

Rank	Hour	2024 3+	2025 3+	Combined 3+	Combined Excess	Total Calls
1	13:00-13:59	11	8	19	20	427
2	09:00-09:59	12	3	15	16	410
3	11:00-11:59	6	8	14	18	424
4	16:00-16:59	6	8	14	17	414
5	14:00-14:59	6	7	13	17	377
6	12:00-12:59	5	8	13	13	398
7	10:00-10:59	6	6	12	16	440
8	18:00-18:59	9	3	12	14	360
9	17:00-17:59	8	4	12	13	384
10	20:00-20:59	6	6	12	13	336

Coverage Window Comparison

The table below compares practical staffing windows. The combined two-year data shows that 09:00-18:59 is the strongest 10-hour window. It outperforms 10:00-19:59 in both total 3+ hour-slots captured and excess demand captured.

Window	Hours	3+ Captured	% 3+	Excess Captured	% Excess	Total Calls
09:00-14:59	6	86	43.7%	100	44.4%	2,476
09:00-16:59	8	106	53.8%	127	56.4%	3,262
09:00-18:59	10	130	66.0%	154	68.4%	4,006
09:00-20:59	12	151	76.6%	177	78.7%	4,678
10:00-17:59	8	103	52.3%	124	55.1%	3,236
10:00-19:59	10	124	62.9%	148	65.8%	3,932
10:00-21:59	12	145	73.6%	171	76.0%	4,560



Best Window by Duration

If EMSAC wants to compare staffing duration instead of selecting a fixed window first, the best combined windows by duration are shown below.

Duration	Rank	Window	3+ Captured	% 3+	Excess	% Excess
6	1	09:00-14:59	86	43.7%	100	44.4%
6	2	08:00-13:59	82	41.6%	93	41.3%
6	3	11:00-16:59	79	40.1%	95	42.2%
8	1	09:00-16:59	106	53.8%	127	56.4%
8	2	10:00-17:59	103	52.3%	124	55.1%
8	3	11:00-18:59	103	52.3%	122	54.2%
10	1	09:00-18:59	130	66.0%	154	68.4%
10	2	08:00-17:59	127	64.5%	150	66.7%
10	3	10:00-19:59	124	62.9%	148	65.8%
12	1	09:00-20:59	151	76.6%	177	78.7%
12	2	08:00-19:59	148	75.1%	174	77.3%
12	3	10:00-21:59	145	73.6%	171	76.0%

Did the Recommendation Shift?

The recommendation shifted slightly within the 2025-only analysis, but not enough to change the two-year policy recommendation. The practical interpretation is that 2025 pushed the peak period later, while 2024 had stronger morning and early-evening pressure. Combined, the most defensible window is still 09:00-18:59.

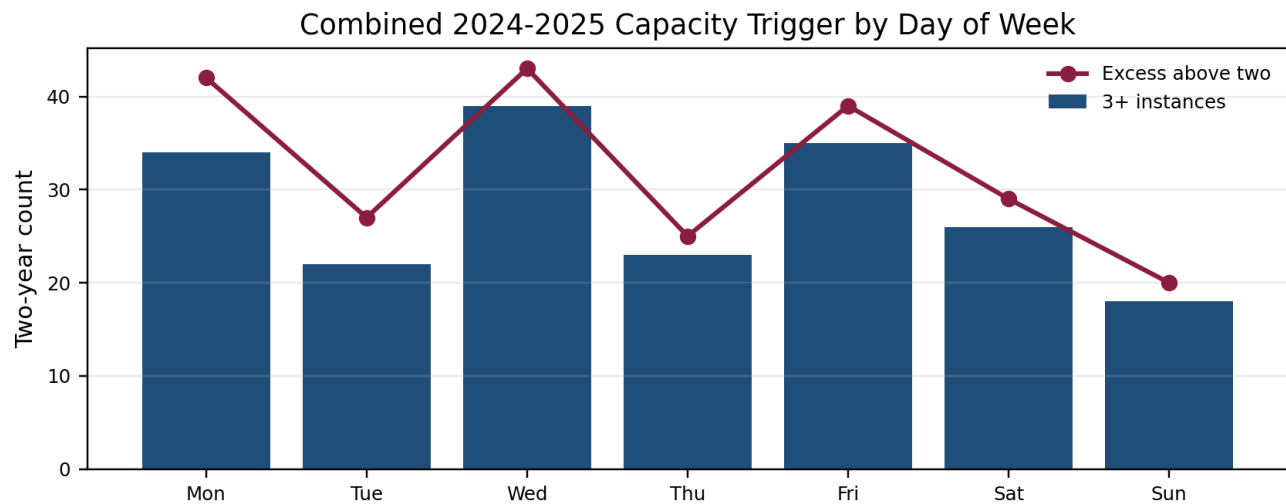
Analysis	Best 10-Hour Window	Interpretation
2024-only analysis	09:00-18:59	Captures 74 of 107 3+ slots and 86 of 120 excess call-units.
2025-only analysis	10:00-19:59	Slightly later data-optimized window; 09:00-18:59 remained close and operationally defensible.
Two-year combined analysis	09:00-18:59	Captures 130 of 197 3+ slots and 154 of 225 excess call-units; stronger than 10:00-19:59.

Operational conclusion: EMSAC does not need to choose between the two annual recommendations. The combined study supports a stable primary staffing window of 09:00-18:59, while allowing 10:00-19:59 to remain a reasonable alternative if staffing availability or shift design strongly favors a later start.

Day-of-Week and Monthly Patterns

The day-of-week results show recurring pressure on Wednesday, Friday, and Monday. This does not mean other days are low-risk; rather, these days carried the most repeated two-year overload indicators.

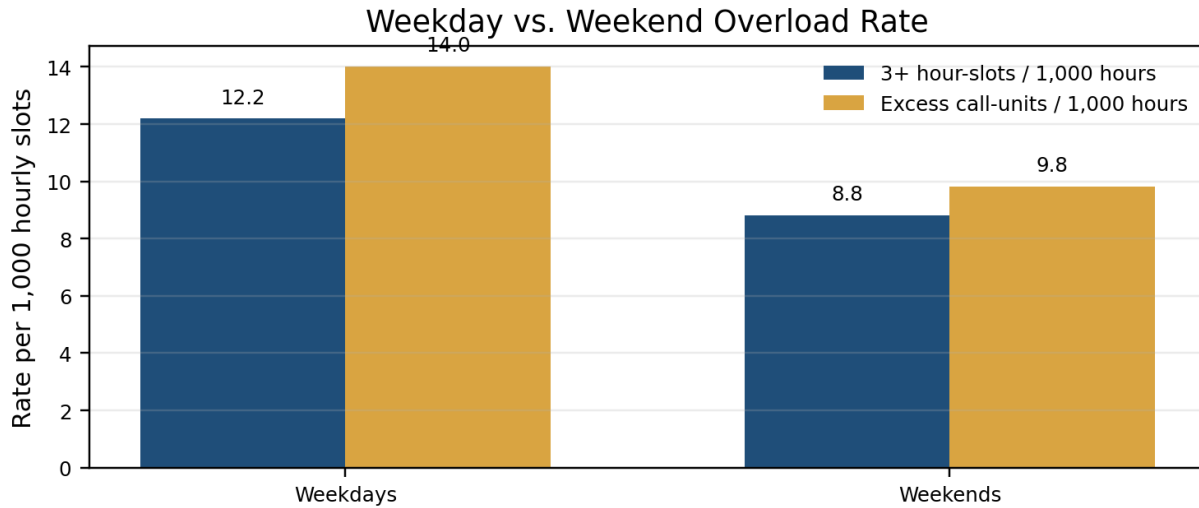
Day	Total Calls	3+ Instances	Excess Above 2
Monday	1,135	34	42
Tuesday	1,012	22	27
Wednesday	1,155	39	43
Thursday	1,042	23	25
Friday	1,061	35	39
Saturday	962	26	29
Sunday	931	18	20



Weekday vs. Weekend Difference

The two-year data shows a meaningful difference between weekdays and weekends. Weekdays are busier overall and produce more repeated 3+ call-hour pressure even after normalizing for the number of hourly slots. Weekends are not zero-risk, but the weekend pattern is lower in overall overload frequency and somewhat more evening-sensitive.

Period	Days	Total Calls	Avg Calls/Day	3+ Slots	Excess	3+ Rate / 1K Hrs	Excess Rate / 1K Hrs
Weekdays	523	5,405	10.3	153	176	12.2	14.0
Weekends	208	1,893	9.1	44	49	8.8	9.8



Operational interpretation: the weekday need is stronger and more consistent. The weekend need is lower, but the best weekend capture window is broader and later. This supports a regular weekday-focused third ambulance/back-up crew strategy, with a weekend surge/on-call approach instead of routine full third-unit staffing every weekend.

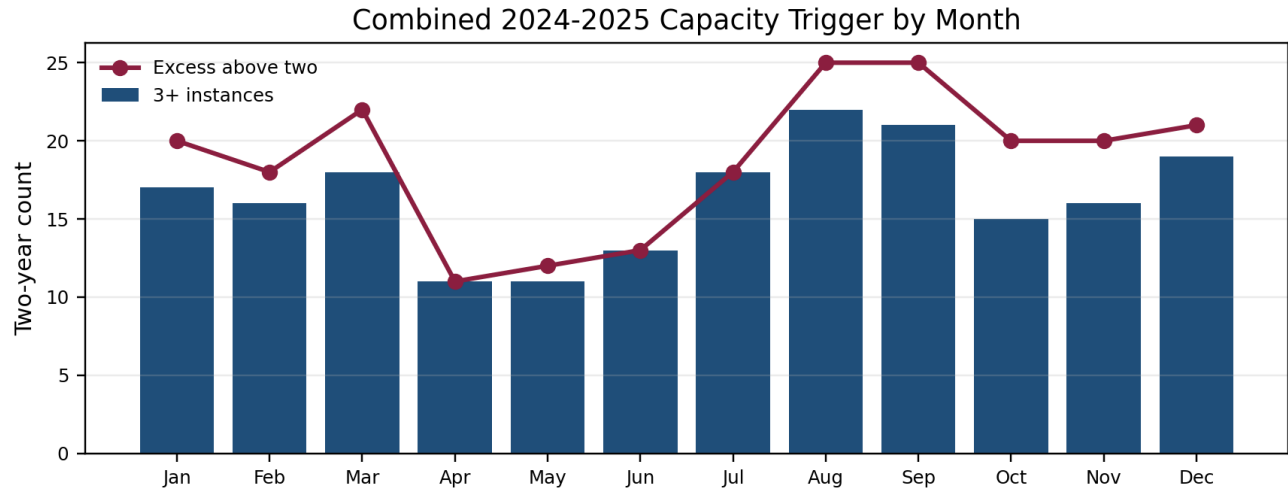
Period	Candidate Window	3+ Slots Captured	Excess Captured
Weekdays	09:00-16:59	87	104
Weekdays	09:00-18:59	105	125
Weekdays	10:00-19:59	99	118
Weekdays	09:00-20:59	118	139
Weekends	09:00-16:59	19	23
Weekends	09:00-18:59	25	29
Weekends	10:00-19:59	25	30
Weekends	09:00-20:59	33	38

For weekdays, 09:00-18:59 remains the best operationally balanced window. For weekends, 09:00-20:59 captures more weekend overload than the shorter windows, making it more appropriate as a surge/on-call availability window rather than a standing full-staffing recommendation.

Monthly results are less decisive than hour-of-day results. The two-year monthly pattern shows some variation, but the strongest planning signal remains time-of-day rather than seasonality.

Month	Total Calls	3+ Instances	Excess Above 2
January	656	17	20
February	583	16	18
March	585	18	22
April	557	11	11
May	608	11	12
June	604	13	13
July	629	18	18
August	605	22	25
September	637	21	25

Month	Total Calls	3+ Instances	Excess Above 2
October	593	15	20
November	590	16	20
December	651	19	21



One-Unit Sensitivity: When Fewer Than Two Ambulances Are Available

The primary study uses 3+ calls per hour because two ambulances are the typical planning baseline. However, when only one ambulance is available, the operational risk begins at 2+ calls in the same hour. This matters because the agency noted that two ambulances are typical, but actual availability is sometimes less.

Rank	Hour	2+ Instances	Excess Above 1	Total Calls	Also 3+
1	10:00-10:59	95	111	440	12
2	11:00-11:59	92	110	424	14
3	13:00-13:59	88	108	427	19
4	09:00-09:59	85	101	410	15
5	16:00-16:59	81	98	414	14
6	17:00-17:59	72	85	384	12
7	08:00-08:59	70	80	378	9
8	12:00-12:59	67	80	398	13
9	18:00-18:59	65	79	360	12
10	15:00-15:59	64	74	372	6

For reduced-availability days, the sensitivity results point to the same general daytime risk period. The top one-unit risk hours are 10:00, 11:00, 13:00, 09:00, and 16:00. This reinforces the need for proactive coverage management during the recommended daytime back-up window.

Attachment A: Combined Study and Final EMSAC Recommendation

This attachment is intended to complete the two-year study and provide a final recommendation that can be used in EMSAC discussion, system planning, budget conversations, and public-facing explanation of ambulance capacity need.

Finding 1 - The need is predictable enough to plan around.

The two-year dataset produced 197 hour-slots where demand reached 3 or more medical calls in the same hour. Although this represents only 1.1% of all hours, those are the exact hours where the normal two-ambulance assumption is strained. The issue is not that overload occurs every hour; the issue is that overload occurs in a repeated, identifiable pattern.

Finding 2 - The primary pressure period is daytime through early evening.

The strongest combined 10-hour window is 09:00-18:59. This window captures 130 of the 197 combined 3+ hour-slots and 154 of the 225 excess call-units above the two-ambulance baseline. The next closest 10-hour window, 10:00-19:59, captures 124 3+ hour-slots and 148 excess call-units. The difference is not enormous, but it is enough to keep 09:00-18:59 as the better two-year recommendation.

Finding 3 - A shorter window is useful, but it leaves a meaningful portion of risk uncovered.

The lower-cost 09:00-16:59 option captures 106 of the 197 3+ hour-slots and 127 of the 225 excess call-units. This is a defensible 8-hour option if resources are limited, but it misses late-afternoon and early-evening pressure that the 10-hour window captures.

Finding 4 - A broader on-call or surge window adds operational resilience.

The 09:00-20:59 window captures 151 of the 197 combined 3+ hour-slots and 177 of the 225 excess call-units. This does not necessarily mean EMSAC must recommend a fully staffed 12-hour third ambulance. It does support having a clear surge, back-up, volunteer, or on-call plan during that broader daytime/evening period.

Finding 5 - Weekday pressure is stronger than weekend pressure.

Weekdays produced 153 of the 197 combined 3+ hour-slots and 176 of the 225 combined excess call-units. Weekends produced 44 3+ hour-slots and 49 excess call-units. Normalized by hourly slots, the weekday 3+ overload rate was 12.2 per 1,000 hours compared with 8.8 per 1,000 hours on weekends.

This finding supports a weekday-focused regular staffing strategy. Weekends should remain part of the contingency plan, but the data is better suited to a weekend surge/on-call model, particularly from 09:00-20:59, rather than routine full third-ambulance staffing every weekend.

Final Recommendation

EMSAC should recognize the period from 09:00-18:59 as the primary ambulance capacity risk window and use that window as the planning basis for a third ambulance/back-up crew strategy.

- Preferred model: Schedule or otherwise ensure reliable third ambulance/back-up crew capability from 09:00-18:59.
- Minimum/phase-in model: Use 09:00-16:59 as the first lower-cost implementation step if a 10-hour window is not initially feasible.
- Surge model: Maintain a defined back-up or on-call response expectation from 09:00-20:59, especially on days when two-unit availability is already reduced.
- Weekday/weekend model: Prioritize regular third ambulance/back-up crew availability on weekdays; use weekend surge/on-call coverage, especially during 09:00-20:59, rather than treating weekends as equal to weekdays.
- Reduced-availability trigger: When only one ambulance is available, treat 2+ calls in an hour as the operational warning threshold and activate contingency coverage early.
- Ongoing measurement: Track call duration, transport time, turnaround time, simultaneous calls, unit-hour availability, mutual-aid use, and delayed responses so the recommendation can be refined with operational performance data, not just call counts.

Recommended EMSAC Policy Direction

EMSAC should frame the recommendation as a system capacity and resiliency measure, not simply as a desire for another ambulance. The two-year data shows a recurring gap between predictable medical-call demand and the normal two-ambulance baseline. A third ambulance/back-up crew strategy during 09:00-18:59 would address the most repeated overload period while preserving flexibility for local staffing, funding, and operational design.

Adopted planning window	09:00-18:59
Primary purpose	Reduce recurring periods where medical call demand exceeds the normal two-ambulance baseline.
Most defensible lower-cost phase-in	09:00-16:59
Best broader surge period	09:00-20:59
Weekday/weekend conclusion	Weekdays show stronger recurring overload; weekends are lower overall but better handled through a 09:00-20:59 surge/on-call concept.
Two-year conclusion	The recommendation stays substantially the same; the combined data reinforces the 2024 09:00-18:59 window.

Source data: 2024 Calls per hour.xlsx and 2025 calls per hour.xlsx; supporting calculations generated from the annual capacity analysis workbooks.

2024 Medical Call Hourly Capacity Analysis

Third Ambulance / Back-Up Crew Planning Recommendation

Prepared for EMSAC discussion and system-planning use

Executive Summary

The 2024 hourly medical-call dataset includes 366 days, 8,784 hourly demand slots, and 3,729 medical calls. The analysis identifies the hour-slots where medical call volume reached 3 or more calls in the same hour, because that is the practical planning assumption for a system that normally expects two ambulances to be available.

In 2024, there were 107 hour-slots with 3 or more medical calls. Those slots represent 1.2% of all hours in the year, but they account for the specific periods when demand exceeded the normal two-ambulance baseline. The excess demand above that baseline was 120 call-units.

The strongest 2024 data pattern is concentrated from morning through early evening. The best 10-hour contiguous window is 09:00-18:59, which captured 74 of the 107 3+ hour-slots and 86 of the 120 excess call-units above two ambulances. A 09:00-16:59 window remains a defensible lower-cost option, while 09:00-20:59 provides the strongest broad daytime/evening surge window. The 2024 data supports a planned third ambulance/back-up crew capability during the predictable daytime and early-evening risk period.

Primary 2024 recommendation	Plan third ambulance/back-up crew availability from 09:00-18:59.
Lower-cost fallback	Use 09:00-16:59 as the preferred 8-hour option.
Surge/on-call extension	Maintain rapid back-up capability from 09:00-20:59 when feasible.
Planning caution	When only one ambulance is available, the risk threshold becomes 2+ calls in an hour.

Planning Background and Methodology

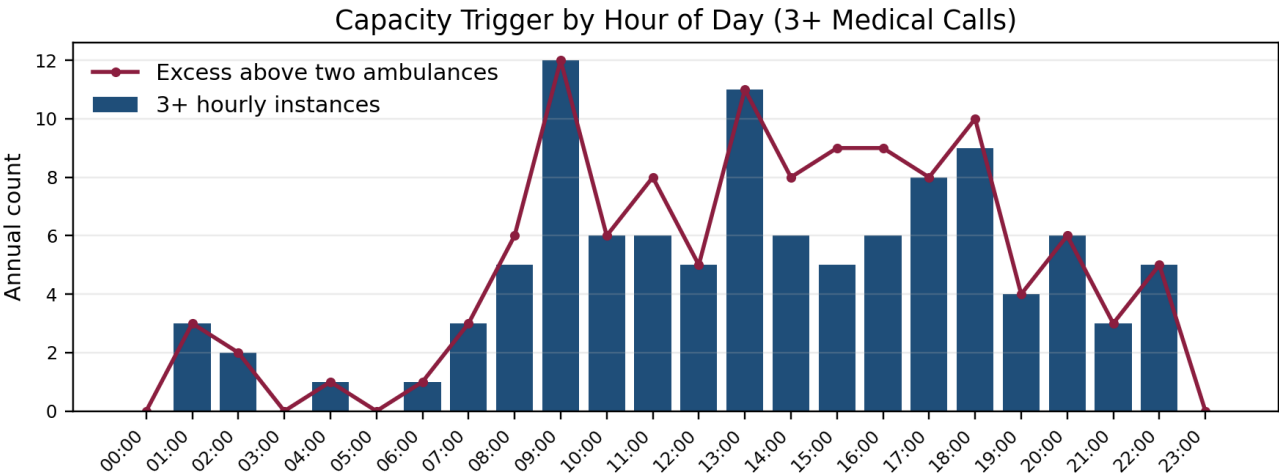
This analysis treats each date-hour combination as a separate demand slot. For each hour of each day, the dataset reports the number of medical calls occurring during that hour. The purpose is to measure real annual call volume only; it is not designed to identify calls as simultaneous or non-simultaneous beyond hour-level demand.

Why 3+ calls matters:

- If two ambulances are normally available, three or more medical calls in one hour creates an immediate probability that the system will need another response unit, another crew, mutual aid, or delayed response management.
- A 3+ call hour does not automatically mean every call occurred at the exact same minute. It does show that the hour contained enough demand to exceed a two-ambulance operating assumption.
- A call-hour dataset is a planning proxy. Actual ambulance strain depends on call duration, transport time, hospital turnaround time, geography, out-of-area transports, crew status, dispatch processing, and mutual-aid availability.
- Because local availability is sometimes less than two ambulances, a separate sensitivity analysis looks at 2+ call hours. When only one ambulance is available, calls in the same hour create the same operational problem that three calls create under a two-ambulance assumption.

Key 2024 Metrics

Metric	2024 Result
Days analyzed	366
Total medical calls analyzed	3,729
Hourly demand slots	8,784
Average calls per day	10.19
Hour-slots with 3+ calls	107
Share of all hourly slots at 3+	1.2%
Excess calls above two-ambulance baseline	120
Maximum calls in a single hour	5
Dates with at least one 3+ hour	97 (26.5%)



Hour-of-Day Findings

The strongest overload pattern occurs from morning through early evening. The highest individual hours for 3+ call demand were 09:00, 13:00, 18:00, 17:00, and 16:00. This pattern supports a planned daytime/evening back-up capability rather than a purely overnight-centered staffing response.

Rank	Hour	3+ Instances	Excess Above 2	Total Calls	Max Calls	Workbook Rank
1	09:00-09:59	12	12	216	3	1
2	13:00-13:59	11	11	227	3	2
3	18:00-18:59	9	10	188	4	3
4	17:00-17:59	8	8	217	3	4
5	16:00-16:59	6	9	208	5	5
6	11:00-11:59	6	8	203	5	6
7	14:00-14:59	6	8	188	4	7
8	10:00-10:59	6	6	229	3	8
9	00:00-00:59	0	0	170	0	9

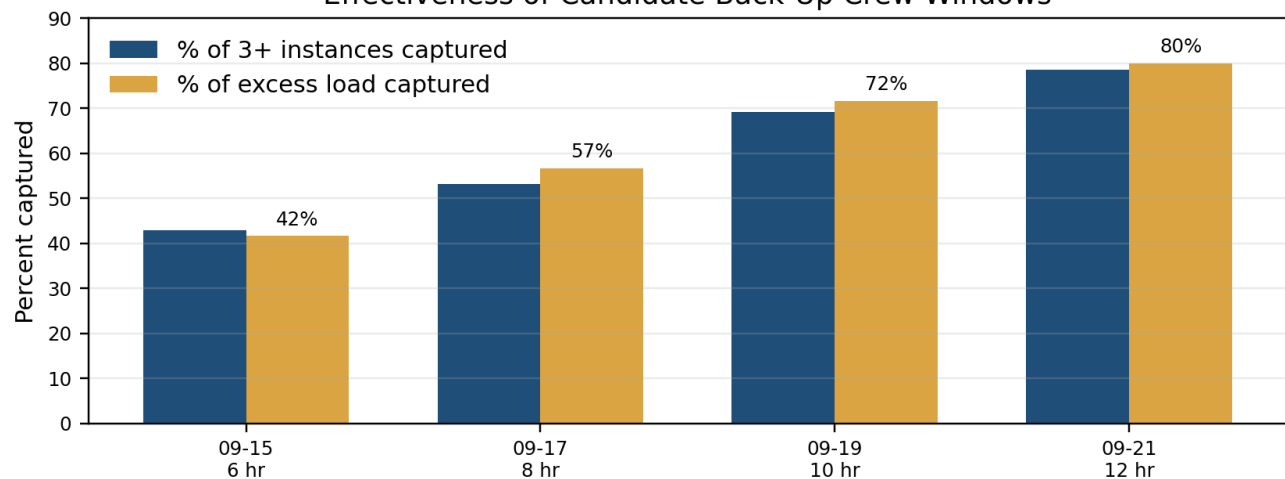
Rank	Hour	3+ Instances	Excess Above 2	Total Calls	Max Calls	Workbook Rank
10	15:00-15:59	5	9	194	5	10

Coverage Window Options

The following windows are not intended to be the only possible staffing models. They are decision aids. The table shows how much of the 2024 overload problem each candidate third-ambulance/back-up crew window captures.

Window	Hours	3+ Captured	Share of 3+	Excess Captured	Share of Excess	Total Calls
09:00-14:59	6	46	43.0%	50	41.7%	1265
09:00-16:59	8	57	53.3%	68	56.7%	1667
09:00-18:59	10	74	69.2%	86	71.7%	2072
09:00-20:59	12	84	78.5%	96	80.0%	2406
13:00-18:59	6	45	42.1%	55	45.8%	1222
11:00-18:59	8	56	52.3%	68	56.7%	1627

Effectiveness of Candidate Back-Up Crew Windows



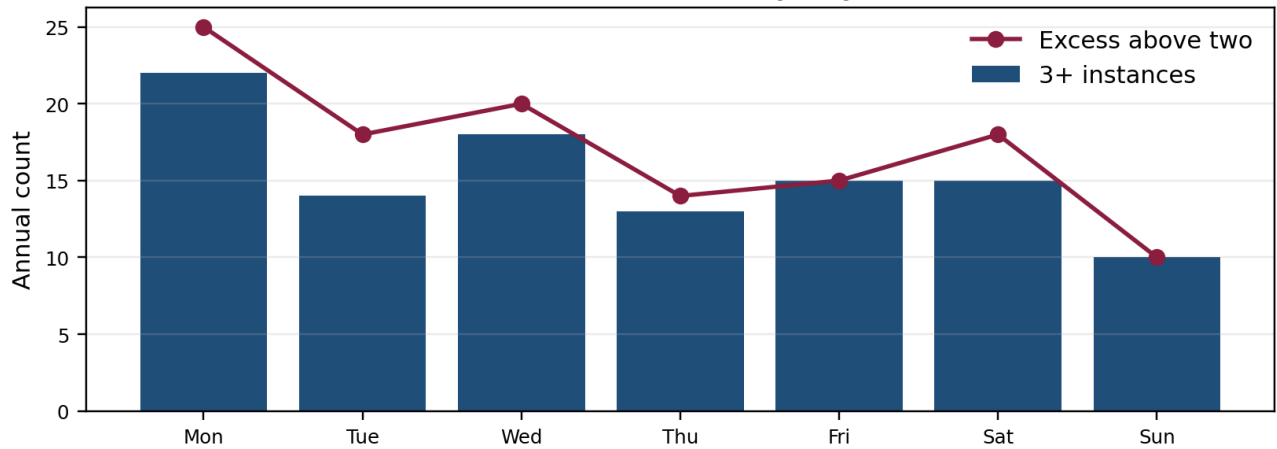
Interpretation:

- 09:00-18:59 is the best 10-hour window in the 2024 dataset, capturing 74 of 107 3+ hour-slots (69.2%) and 86 of 120 excess call-units (71.7%).
- 09:00-16:59 is the best 8-hour lower-cost option, capturing 57 3+ hour-slots and 68 excess call-units.
- 09:00-20:59 provides the strongest extended surge window, capturing 78.5% of 3+ slots and 80.0% of the excess demand above two ambulances.
- A late-day supplement remains important because the 16:00-18:59 period alone accounts for 23 3+ hour-slots and 27 excess call-units. Ending back-up coverage too early misses a meaningful part of the overload signal.

Day-of-Week and Monthly Findings

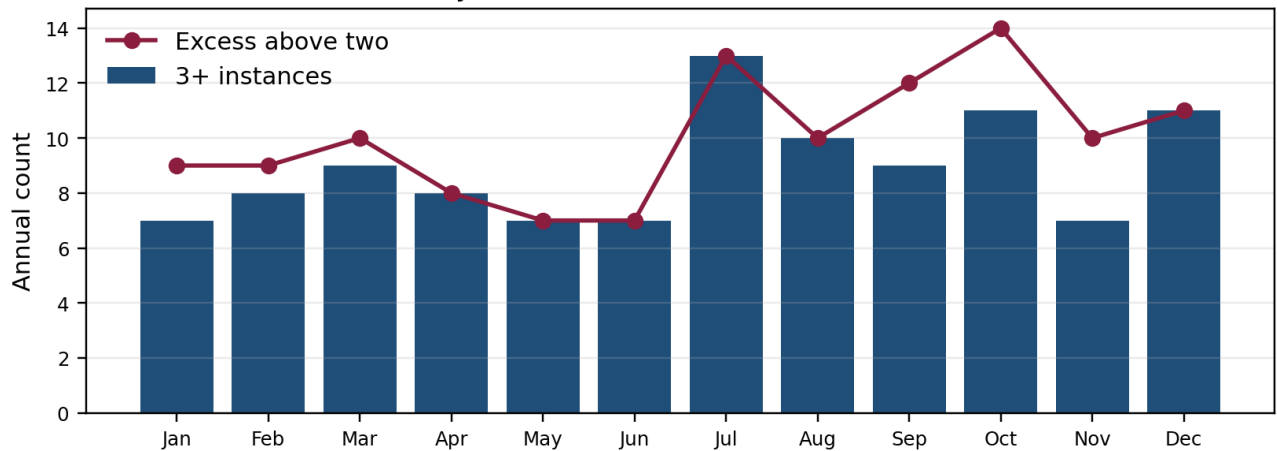
The 2024 day-of-week pattern is strongest on Monday and Wednesday. Monday had the highest number of 3+ hour-slots and the highest excess load above two ambulances. The monthly pattern was elevated in July, October, and December, but overload events occurred in every month.

3+ Medical-Call Instances by Day of Week



Day	Total Calls	3+ Instances	Excess Above 2
Monday	571	22	25
Tuesday	502	14	18
Wednesday	567	18	20
Thursday	522	13	14
Friday	567	15	15
Saturday	505	15	18
Sunday	495	10	10

Monthly Pattern of 3+ Medical-Call Instances



Month	Total Calls	3+ Instances	Excess Above 2
January	325	7	9
February	289	8	9
March	308	9	10
April	302	8	8
May	302	7	7

Month	Total Calls	3+ Instances	Excess Above 2
June	317	7	7
July	332	13	13
August	304	10	10
September	317	9	12
October	314	11	14
November	296	7	10
December	323	11	11

One-Unit Availability Sensitivity

The 3+ trigger is appropriate when the system has two ambulances available. However, the local operating reality is that availability may sometimes fall below two units because of staffing shortages, transports, long-duration calls, vehicle status, or other operational factors. In those periods, two medical calls in the same hour can create an overload condition. The sensitivity analysis therefore uses 2+ calls in the same hour as the trigger when only one ambulance is available. This is not a separate recommendation to staff for every 2+ hour; rather, it shows when the system is most vulnerable if one ambulance is already unavailable.

Rank	Hour	2+ Instances	Excess Above 1	Total Calls	3+ Instances
1	09:00-09:59	50	62	216	12
2	10:00-10:59	50	56	229	6
3	17:00-17:59	46	54	217	8
4	13:00-13:59	41	52	227	11
5	16:00-16:59	41	50	208	6
6	11:00-11:59	40	48	203	6
7	15:00-15:59	37	46	194	5
8	18:00-18:59	35	45	188	9
9	07:00-07:59	35	38	158	3
10	08:00-08:59	33	39	200	5

The one-unit sensitivity reinforces the daytime and early-evening concern. The strongest 2+ call hours were 09:00, 10:00, 17:00, 13:00, and 16:00. This supports protecting the two-ambulance baseline while also using the back-up crew as a third-unit resource during the preferred 09:00-18:59 window.

Operational Interpretation for EMSAC

The 2024 data does not support a conclusion that every hour of the day needs a fully staffed third ambulance. It does support the conclusion that a predictable, recurring capacity problem exists during specific portions of the day. The practical policy question for EMSAC is how to define the minimum reliable system and the surge layer above that minimum.

A two-ambulance baseline may be reasonable as a minimum expectation, but the dataset shows that the county periodically exceeds that baseline. A third ambulance/back-up crew should be treated as a resilience layer for predictable overload, not only as an emergency afterthought.

- Best operational model: a planned third ambulance/back-up crew available 09:00-18:59.
- Lower-cost model: an 8-hour staffed or scheduled back-up option from 09:00-16:59.
- Hybrid model: scheduled back-up availability during 09:00-16:59 with rapid on-call/surge coverage through 20:59.
- Implementation caution: do not allow the back-up crew concept to replace the two-ambulance baseline; it should strengthen the system above that baseline.

Limitations and Follow-Up Data Needs

This report should be used as a planning analysis, not as a complete deployment model. The dataset counts medical calls per hour. It does not, by itself, show call duration, unit status, transport time, hospital turnaround, cancellations, mutual-aid response, interfacility transfers, responder availability, or the precise geography of each call.

The next level of analysis should combine this hourly demand dataset with dispatch timestamps, unit status, transport times, hospital turnaround, mutual-aid requests, cancellations, and geography. That would allow EMSAC to move from demand planning analysis to a more complete coverage and reliability model.

Final Recommendation

EMSAC should use the 2024 data to support development of a planned third ambulance/back-up crew capability during the highest-risk demand period. The primary 2024 recommendation is to plan around 09:00-18:59. This is the best 10-hour contiguous window in the dataset and captures the strongest balance of overload instances and excess demand.

For a lower-cost implementation, EMSAC should consider 09:00-16:59 as the minimum defensible scheduled back-up period. This option captures the best 8-hour concentration of overload, but it should be paired with some late-day surge strategy because the 17:00 and 18:00 hours remain prominent in the overload pattern.

For the most resilient model, EMSAC should pair a scheduled daytime back-up crew with an evening surge or on-call extension through 20:59. This reflects the 2024 data pattern and provides coverage for the period where a full 8-hour daytime back-up shift begins to lose effectiveness.

Recommended policy statement:

Wapello County EMSAC should recognize third ambulance/back-up crew capability as a system resilience priority. Based on the 2024 hourly medical-call analysis, the preferred planning target is a third ambulance/back-up crew available from 09:00-18:59, with 09:00-16:59 as the minimum lower-cost staffed option and 09:00-20:59 as the preferred surge/on-call extension when feasible.

This recommendation does not assume that the third resource must be implemented in one step. EMSAC could phase the model, beginning with an 8-hour pilot, measuring utilization and missed-call/strain events, and then expanding the surge period if the data confirms continued need.

Appendix A - Complete 3+ Instance Listing

The supporting workbook contains the complete list of all 107 hour-slots in 2024 where medical call volume reached three or more calls. The table below shows the first several entries as a preview; the workbook should be used as the complete data reference.

Date	Day	Hour	Calls	Excess Above 2
2024-01-05	Friday	16:00-16:59	3	1
2024-01-05	Friday	19:00-19:59	3	1
2024-01-08	Monday	21:00-21:59	3	1
2024-01-11	Thursday	10:00-10:59	3	1
2024-01-12	Friday	09:00-09:59	3	1
2024-01-13	Saturday	15:00-15:59	5	3
2024-01-17	Wednesday	11:00-11:59	3	1
2024-02-06	Tuesday	09:00-09:59	3	1
2024-02-12	Monday	14:00-14:59	3	1
2024-02-13	Tuesday	15:00-15:59	4	2
2024-02-18	Sunday	09:00-09:59	3	1
2024-02-21	Wednesday	13:00-13:59	3	1
2024-02-23	Friday	06:00-06:59	3	1
2024-02-23	Friday	22:00-22:59	3	1
2024-02-28	Wednesday	13:00-13:59	3	1
2024-03-01	Friday	07:00-07:59	3	1
2024-03-02	Saturday	04:00-04:59	3	1
2024-03-03	Sunday	17:00-17:59	3	1
2024-03-07	Thursday	02:00-02:59	3	1
2024-03-09	Saturday	13:00-13:59	3	1
2024-03-10	Sunday	13:00-13:59	3	1
2024-03-14	Thursday	18:00-18:59	4	2
2024-03-15	Friday	13:00-13:59	3	1
2024-03-19	Tuesday	08:00-08:59	3	1
2024-04-01	Monday	20:00-20:59	3	1

Appendix B - High Overload Dates

There were 97 dates with at least one 3+ hour-slot. Some dates had multiple overload hours, including several high-intensity days. This reinforces that the issue is not confined to a single incident or single outlier day.

Date	Day	3+ Slots	Excess	Max Calls	Trigger Hours
2024-05-08	Wednesday	3	3	3	11:00, 16:00, 17:00
2024-11-20	Wednesday	2	3	4	08:00, 09:00
2024-02-23	Friday	2	2	3	06:00, 22:00
2024-01-05	Friday	2	2	3	16:00, 19:00
2024-07-01	Monday	2	2	3	10:00, 16:00
2024-06-28	Friday	2	2	3	19:00, 20:00
2024-07-07	Sunday	2	2	3	18:00, 21:00
2024-09-09	Monday	2	2	3	01:00, 07:00
2024-10-07	Monday	2	2	3	13:00, 22:00
2024-09-23	Monday	1	3	5	16:00
2024-01-13	Saturday	1	3	5	15:00
2024-10-15	Tuesday	1	3	5	11:00
2024-02-13	Tuesday	1	2	4	15:00
2024-03-14	Thursday	1	2	4	18:00
2024-09-18	Wednesday	1	2	4	14:00

2025 Medical Call Hourly Capacity Analysis

Third Ambulance / Back-Up Crew Planning Recommendation

Prepared for EMSAC discussion and system-planning use

Executive Summary

The 2025 hourly medical-call dataset includes 365 days, 8,760 hourly demand slots, and 3,569 medical calls. The analysis identifies the hour-slots where medical call volume reached three or more calls in the same hour. Because the normal planning assumption is two ambulances available per hour, a 3+ call hour is a practical trigger showing where demand exceeded the normal two-ambulance baseline.

In 2025, there were 90 hour-slots with 3 or more medical calls. Those slots represent 1.0% of all hours in the year, but they account for the specific periods when the system is most likely to need a third ambulance, back-up crew, mutual aid, or some other surge-capacity solution. The excess demand above a two-ambulance baseline was 105 call-units.

The strongest 2025 data pattern is late morning through evening. The best 10-hour contiguous window is 10:00-19:59, which captured 58 of the 90 3+ hour-slots and 70 of the 105 excess call-units above the two-ambulance baseline. That makes 10:00-19:59 the most data-optimized primary planning window for a third ambulance or back-up crew in the 2025 dataset.

A 09:00-18:59 window remains operationally defensible because it captures nearly the same share of overload as the data-optimized 10-hour window while aligning with the prior 2024 planning pattern and traditional daytime operational staffing. However, the 2025 data shows slightly more pressure extending into the evening, especially through 20:00 and 21:00.

Primary 2025 recommendation	Plan third ambulance/back-up crew availability from 10:00-19:59.
Lower-cost fallback	Use 10:00-17:59 as the preferred 8-hour option.
Surge/on-call extension	Maintain rapid back-up capability from 10:00-21:59 when feasible.
Planning caution	When only one ambulance is available, the risk threshold becomes 2+ calls in an hour, not 3+.

Planning Background and Methodology

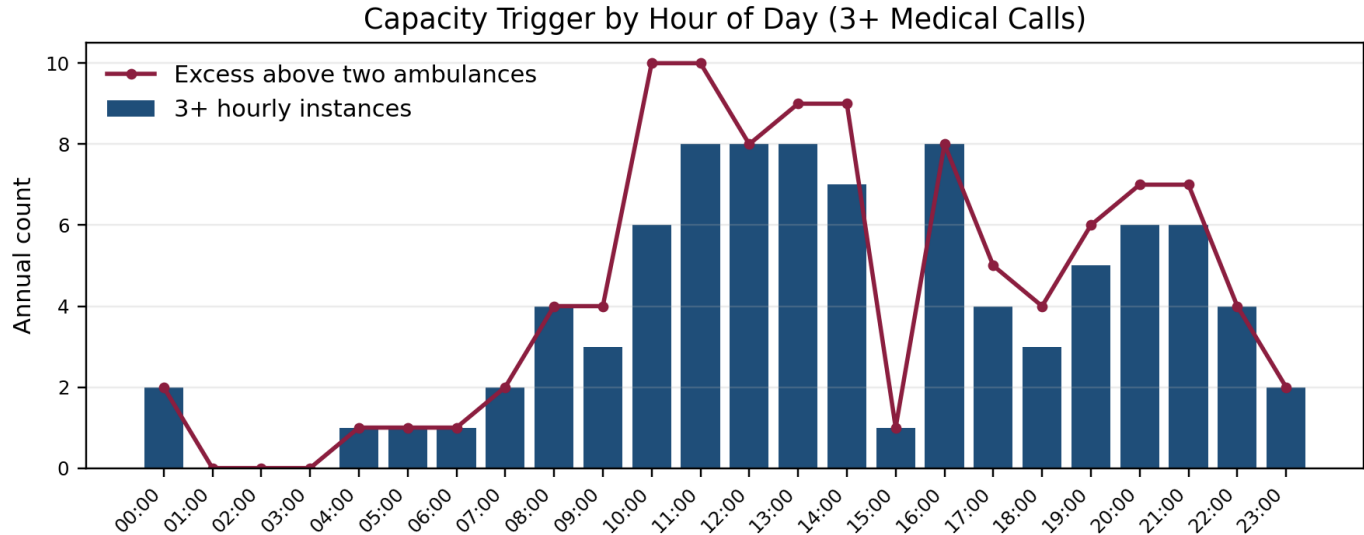
This analysis treats each date-hour combination as a separate demand slot. For each hour of each day, the dataset reports the number of medical calls occurring during that hour. The purpose is not to measure total annual call volume only; it is to identify when simultaneous or near-simultaneous demand becomes most likely to exceed the normal ambulance capacity baseline.

Why 3+ calls matters:

- If two ambulances are normally available, three or more medical calls in one hour creates an immediate probability that the system will need another response unit, another crew, mutual aid, or delayed response management.
- A 3+ call hour does not automatically mean every call occurred at the exact same minute. It does show that the hour contained enough demand to exceed a two-ambulance baseline if calls overlap, require transport, or keep a crew committed beyond the hour.
- A call-hour dataset is a planning proxy. Actual ambulance strain depends on call duration, transport time, hospital turnaround time, geography, out-of-area transports, crew status, dispatch processing, and mutual-aid availability.
- Because local availability is sometimes less than two ambulances, a separate sensitivity analysis looks at 2+ call hours. When only one ambulance is available, two calls in the same hour can create the same operational problem that three calls create under a two-ambulance assumption.

Key 2025 Metrics

Metric	2025 Result
Days analyzed	365
Hourly demand slots analyzed	8,760
Total medical calls	3,569
Average calls per day	9.78
Hour-slots with 3+ calls	90
Share of all hourly slots at 3+	1.0%
Excess call-units above two ambulances	105
Maximum calls in a single hour	5
Dates with at least one 3+ hour	80 (21.9% of days)



Hour-of-Day Findings

The strongest overload pattern occurs from late morning through evening. The highest individual hours for 3+ call demand were 11:00, 12:00, 13:00, and 16:00. The evening period remains important because 19:00, 20:00, and 21:00 collectively add meaningful overload that shifts the best 10-hour window later than the 2024 recommendation.

Rank	Hour	3+ Instances	Excess Above 2	Total Calls	2+ Instances	Max Calls
1	11:00-11:59	8	10	221	52	4
2	13:00-13:59	8	9	200	47	4
3	16:00-16:59	8	8	206	40	3
4	12:00-12:59	8	8	196	35	3
5	14:00-14:59	7	9	189	28	5
6	10:00-10:59	6	10	211	45	5
7	20:00-20:59	6	7	166	25	4
8	21:00-21:59	6	7	134	19	4
9	19:00-19:59	5	6	172	31	4
10	17:00-17:59	4	5	167	26	4

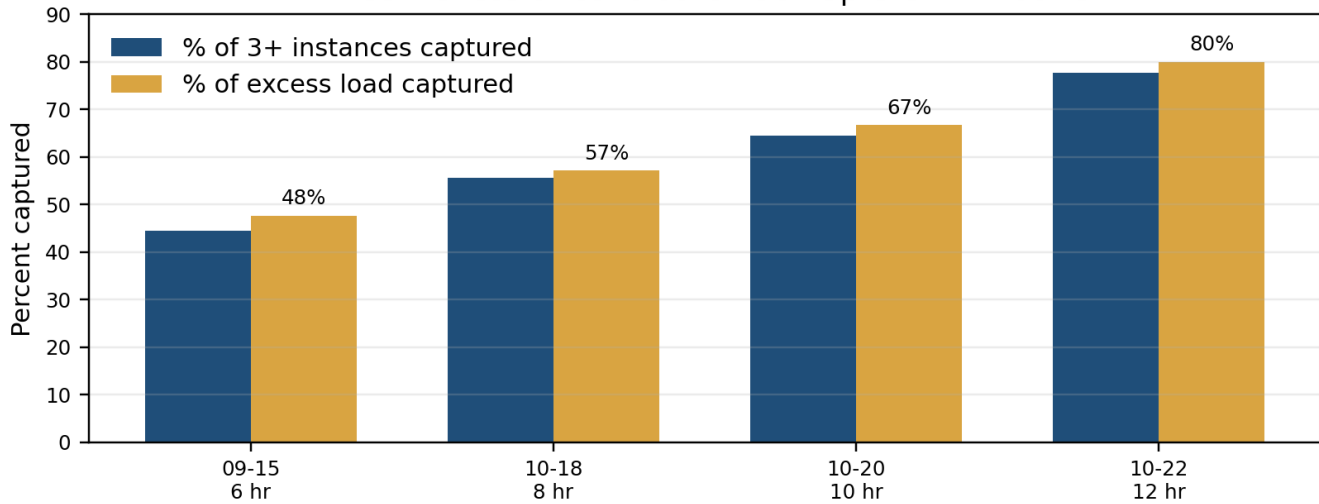
Coverage Window Options

The following windows are not intended to be the only possible staffing models. They are decision aids. The table shows how much of the 2025 overload problem each window captures. A longer window captures more overload, but also costs more. The most useful EMSAC decision is therefore not simply 'which window captures the most,' but which window creates the best balance between operational value, staffing feasibility, and cost.

Window	Hours	3+ Captured	Share of 3+	Excess Captured	Share of Excess	Total Calls
09:00-14:59	6	40	44.4%	50	47.6%	1211

Window	Hours	3+ Captured	Share of 3+	Excess Captured	Share of Excess	Total Calls
10:00-17:59	8	50	55.6%	60	57.1%	1568
10:00-19:59	10	58	64.4%	70	66.7%	1912
10:00-21:59	12	70	77.8%	84	80.0%	2212
09:00-18:59	10	56	62.2%	68	64.8%	1934
09:00-20:59	12	67	74.4%	81	77.1%	2272

Effectiveness of Candidate Back-Up Crew Windows

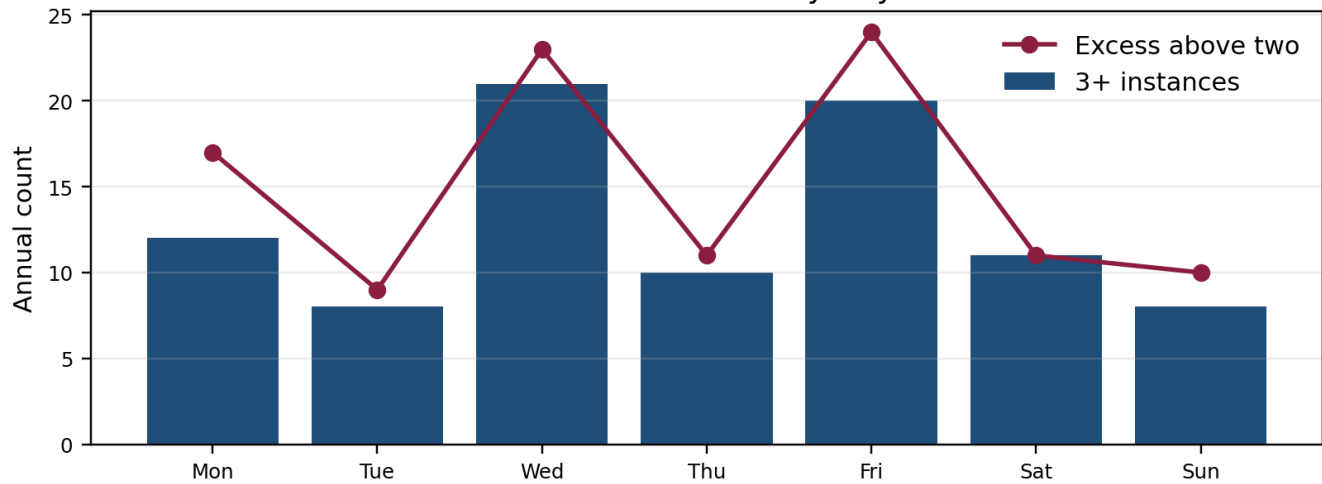
**Interpretation:**

- 10:00-19:59 is the best 10-hour window in the 2025 dataset, capturing 58 of 90 3+ hour-slots (64.4%) and 70 of 105 excess call-units (66.7%).
- 10:00-17:59 is the best 8-hour lower-cost option, capturing 50 3+ hour-slots and 60 excess call-units.
- 10:00-21:59 provides the strongest extended surge window, capturing 77.8% of 3+ slots and 80.0% of the excess demand above two ambulances.
- 09:00-18:59 remains close to the 2025 optimum. It captures 56 3+ hour-slots and 68 excess call-units. If the system needs continuity with the 2024 planning frame, this remains defensible.

Day-of-Week and Monthly Findings

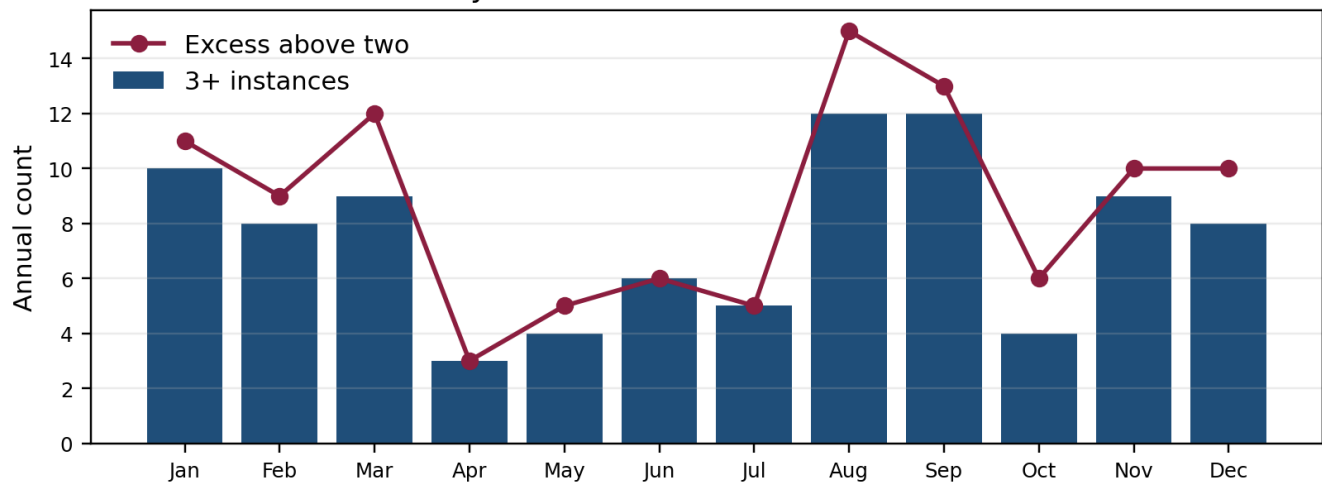
The 2025 day-of-week pattern is strongest on Wednesday and Friday. Friday had the highest excess load above two ambulances, while Wednesday had the highest number of 3+ hour-slots. Monday remains a notable demand day. The monthly pattern shows higher overload in late summer and early fall, with August and September producing the highest number of 3+ hour-slots.

3+ Medical-Call Instances by Day of Week



Day	Total Calls	3+ Instances	Excess Above 2
Monday	564	12	17
Tuesday	510	8	9
Wednesday	588	21	23
Thursday	520	10	11
Friday	494	20	24
Saturday	457	11	11
Sunday	436	8	10

Monthly Pattern of 3+ Medical-Call Instances



Month	Total Calls	3+ Instances	Excess Above 2
January	331	10	11
February	294	8	9
March	277	9	12
April	255	3	3
May	306	4	5
June	287	6	6
July	297	5	5
August	301	12	15
September	320	12	13
October	279	4	6
November	294	9	10
December	328	8	10

One-Unit Availability Sensitivity

The 3+ trigger is appropriate when the system has two ambulances available. However, the local operating reality is that availability may sometimes fall below two units because of staffing shortages, transfers, long-duration calls, vehicle status, or other commitments. In those periods, two medical calls in the same hour can create an overload condition.

The sensitivity analysis therefore uses 2+ calls in the same hour as the trigger when only one ambulance is available. This is not a separate recommendation to staff around every 2+ hour; rather, it shows when the system is most vulnerable if one unit is already unavailable.

Rank	Hour	2+ Instances	Excess Above 1	Total Calls	3+ Instances
1	11:00-11:59	52	62	221	8
2	13:00-13:59	47	56	200	8
3	10:00-10:59	45	55	211	6
4	16:00-16:59	40	48	206	8
5	08:00-08:59	37	41	178	4
6	12:00-12:59	35	43	196	8
7	09:00-09:59	35	39	194	3
8	19:00-19:59	31	37	172	5
9	18:00-18:59	30	34	172	3
10	14:00-14:59	28	37	189	7

The one-unit sensitivity reinforces the late-morning through early-evening concern. The strongest 2+ call hours were 11:00, 13:00, 10:00, 16:00, and 08:00. This supports a policy expectation that a back-up crew should be easier to activate during the workday and early evening, especially when only one transport ambulance is available.

Operational Interpretation for EMSAC

The 2025 data does not support a conclusion that every hour of the day needs a fully staffed third ambulance. It does support the conclusion that a predictable, recurring capacity problem exists during specific portions of the day. The practical policy question is how EMSAC wants to define the minimum reliable system and the surge layer above that minimum.

A two-ambulance baseline may be reasonable as a minimum expectation, but the dataset shows that the county periodically exceeds that baseline. A third ambulance/back-up crew should be treated as a resilience layer for predictable overload, not as a luxury enhancement. The decision can be scaled based on cost and staffing feasibility:

- Best operational model: a planned third ambulance/back-up crew available 10:00-19:59.
- Lower-cost model: an 8-hour staffed or scheduled back-up option from 10:00-17:59.
- Hybrid model: scheduled back-up availability during 10:00-17:59 with rapid on-call/surge coverage through 21:59.
- Continuity model: 09:00-18:59 if the system wants to preserve the 2024 planning window while acknowledging that the 2025 data shows additional evening pressure.

Limitations and Follow-Up Data Needs

This report should be used as a planning analysis, not as a complete deployment model. The dataset counts medical calls per hour. It does not, by itself, show call duration, actual ambulance assignment, cancelled calls, mutual-aid response, simultaneous dispatch times, hospital wall time, out-of-county transfers, or whether a specific unit was unavailable at the time of the call.

The next level of analysis should combine this hourly demand dataset with dispatch timestamps, unit status, transport times, hospital turnaround, mutual-aid requests, staffing levels, and times when only one ambulance was available. That would allow EMSAC to move from demand-pattern analysis to a more complete coverage and reliability model.

Final Recommendation

EMSAC should use the 2025 data to support development of a planned third ambulance/back-up crew capability during the highest-risk demand period. The primary 2025 recommendation is to target 10:00-19:59. This is the best 10-hour contiguous window in the dataset and captures the strongest balance of overload instances and excess demand.

For a lower-cost implementation, EMSAC should consider 10:00-17:59 as the minimum defensible scheduled back-up period. This option captures the best 8-hour concentration of 2025 overload. If staffing cannot support a fully scheduled third unit, EMSAC should still define a formal rapid activation process during this period.

For the most resilient model, EMSAC should pair a scheduled daytime back-up crew with an evening surge or on-call extension through 21:59. This reflects the 2025 shift toward late-day and evening overload while avoiding the cost of a full 24-hour third ambulance.

Recommended policy statement:

Wapello County EMSAC should recognize third ambulance/back-up crew capability as a system resilience priority. Based on the 2025 hourly medical-call analysis, the Council should prioritize additional ambulance capacity from 10:00-19:59, with 10:00-17:59 as the minimum lower-cost implementation window and 10:00-21:59 as the preferred surge/on-call availability window when feasible.

Appendix A - Complete 3+ Instance Listing

The supporting workbook contains the complete list of all 90 hour-slots in 2025 where medical call volume reached three or more calls. The table below shows the first several entries as a preview; the workbook should be used as the complete data reference.

Date	Day	Hour	Calls	Excess Above 2
2025-01-10	Friday	08:00-08:59	3	1
2025-01-10	Friday	10:00-10:59	4	2
2025-01-12	Sunday	16:00-16:59	3	1
2025-01-12	Sunday	20:00-20:59	3	1
2025-01-15	Wednesday	11:00-11:59	3	1
2025-01-17	Friday	12:00-12:59	3	1
2025-01-23	Thursday	07:00-07:59	3	1
2025-01-24	Friday	20:00-20:59	3	1
2025-01-28	Tuesday	23:00-23:59	3	1
2025-01-29	Wednesday	19:00-19:59	3	1
2025-02-02	Sunday	20:00-20:59	3	1
2025-02-05	Wednesday	08:00-08:59	3	1
2025-02-07	Friday	16:00-16:59	3	1
2025-02-08	Saturday	10:00-10:59	3	1
2025-02-10	Monday	10:00-10:59	3	1
2025-02-11	Tuesday	20:00-20:59	3	1
2025-02-17	Monday	11:00-11:59	4	2
2025-02-21	Friday	22:00-22:59	3	1
2025-03-03	Monday	13:00-13:59	4	2
2025-03-04	Tuesday	09:00-09:59	3	1
2025-03-07	Friday	13:00-13:59	3	1
2025-03-15	Saturday	11:00-11:59	3	1
2025-03-19	Wednesday	16:00-16:59	3	1
2025-03-24	Monday	18:00-18:59	4	2
2025-03-25	Tuesday	09:00-09:59	4	2

Appendix B - High Overload Dates

There were 80 dates with at least one 3+ hour-slot. One date had three 3+ hour-slots; several dates had two. This reinforces that the issue is not confined to a single incident day or single anomalous event.

Date	Day	3+ Slots	Excess	Max Calls	Trigger Hours
2025-09-03	Wednesday	3	3	3	12:00, 18:00, 21:00
2025-01-10	Friday	2	3	4	08:00, 10:00
2025-11-14	Friday	2	3	4	04:00, 10:00
2025-01-12	Sunday	2	2	3	16:00, 20:00
2025-06-04	Wednesday	2	2	3	12:00, 19:00
2025-06-06	Friday	2	2	3	11:00, 13:00
2025-08-02	Saturday	2	2	3	16:00, 23:00
2025-10-24	Friday	2	2	3	08:00, 11:00
2025-12-19	Friday	2	2	3	12:00, 14:00
2025-08-22	Friday	1	3	5	10:00
2025-10-27	Monday	1	3	5	14:00
2025-02-17	Monday	1	2	4	11:00
2025-03-03	Monday	1	2	4	13:00
2025-03-24	Monday	1	2	4	18:00
2025-03-25	Tuesday	1	2	4	09:00

ADDENDUM

2026 Year-to-Date Update

Appended to the 2024-2025 Medical Call Hourly Capacity Study

Why this section was added

The 2024 and 2025 findings on the preceding 24 pages are unchanged and remain the basis of this study. The pages that follow add the 2026 year-to-date medical call dataset (January 1 through May 26, 2026) to determine whether five additional months of data change the prior two-year EMSAC recommendation for a third ambulance / back-up crew.

How the 2026 data is treated

Because 2026 is a partial year (146 days versus 365-366 for 2024 and 2025), the following section does not compare raw totals directly against full-year figures. It uses two methods instead: rate-normalized metrics (events per 1,000 hourly slots) so periods of different length can be compared fairly, and a same-period comparison against the equivalent January 1 – May 26 window in 2024 and 2025. A straight-line, full-year projection is also shown for context; it is a trajectory, not a forecast.

Bottom line

- Recommendation unchanged: the primary planning window remains 09:00–18:59, consistent across 2024 alone, 2025 alone, the 2024-2025 combined study, and the three-period dataset with 2026 YTD included.
- Urgency increased: 2026 YTD shows a higher capacity-strain rate than either full prior year — 14.3 3+ call-hours per 1,000 hours, versus 12.2 (2024) and 10.3 (2025) — driven by more calls clustering into the same hour rather than by growth in total call volume.
- New finding – weekend risk: 2026 YTD narrows the weekday/weekend gap seen in the 2024-2025 data, supporting an active weekend surge posture rather than treating weekends as low-risk.
- Caution: January–May is historically the calmer half of the year in this system (see the monthly patterns in the 2024 and 2025 sections). The full-year 2026 picture should be revisited once complete data is available.

The full 2026 year-to-date analysis begins on the next page.

2024-2026 YTD Medical Call Capacity Trend Study

Three-Year/YTD Third Ambulance / Back-Up Crew Planning Recommendation

Prepared for EMSAC discussion, system planning, and policy development

Executive Summary

This report combines the complete 2024 and 2025 medical call-hour datasets with the 2026 year-to-date dataset covering January 1, 2026 through May 26, 2026. The purpose is to determine whether the 2026 trend changes the prior EMSAC recommendation for a third ambulance/back-up crew.

Across the three-period dataset, there are 877 days, 21,048 hourly demand slots, and 8,763 medical calls. The dataset contains 247 hour-slots with 3 or more medical calls and 288 excess call-units above a two-ambulance planning baseline.

Bottom line: The 2026 YTD trend does not move the recommended primary coverage window away from 09:00-18:59. It does, however, strengthen the case for implementation because 2026 shows more call clustering and more excess demand above two ambulances than the 2024-2025 same-period average.

Primary three-period recommendation	Implement or pilot reliable third ambulance/back-up crew capability from 09:00-18:59.
What changed with 2026 YTD	The time window remains stable, but the urgency increases because 2026 has higher overload and excess-demand rates.
Lower-cost phase-in	Use 09:00-16:59 as the most defensible 8-hour step; pair it with an evening surge expectation.
Broader surge/on-call period	Maintain a defined surge/back-up expectation from 09:00-20:59; consider 10:00-21:59 on high-risk or weekend days.
Weekday/weekend update	Prioritize weekdays for routine coverage, but treat weekends as active surge-risk periods because the 2026 gap has narrowed.
Reduced-availability trigger	When only one ambulance is available, treat 2+ calls in an hour as the operational warning threshold.

2026 YTD Shows Higher Capacity Strain Rate

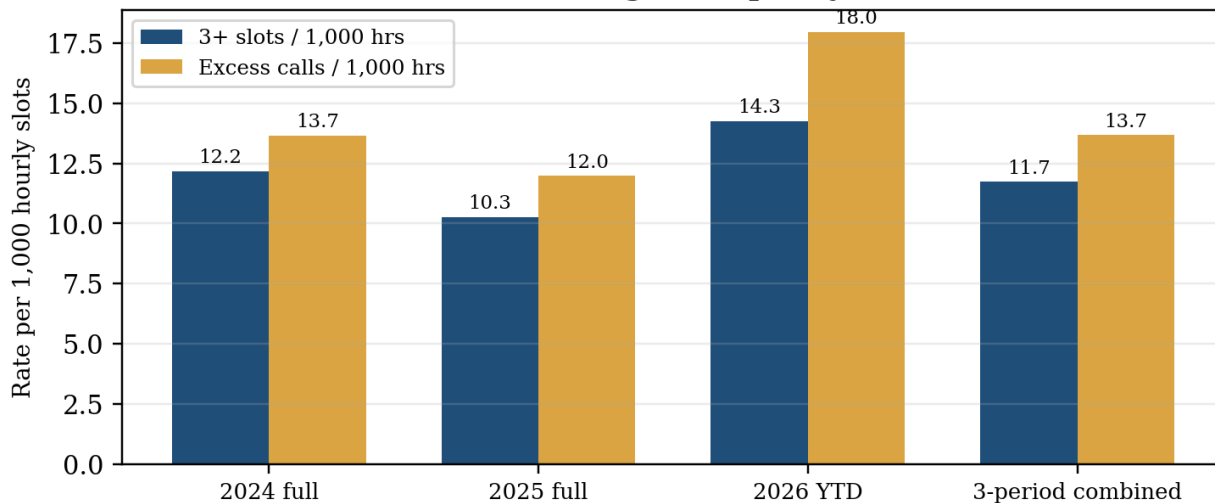


Figure 1. 2026 YTD shows a higher capacity-strain rate than either full-year dataset and the combined three-period dataset.

Planning Background and Methodology

The analysis uses hour-level medical call counts. Each date-hour combination is treated as one demand slot. A slot with 3 or more medical calls is a capacity trigger because the normal planning assumption is two ambulances available per hour.

When a third medical call occurs in the same hour, the system may need a third unit, back-up crew, mutual aid, delayed response management, or another operational adjustment.

The 2026 dataset is year-to-date, not a complete calendar year. For that reason, this report uses two different comparisons: full-period combined analysis and same-period trend analysis. The same-period comparison uses January 1 through May 26 for 2024, 2025, and 2026 so that the 2026 trend is compared against equivalent prior-year timeframes.

This should be interpreted as a capacity planning tool, not as a minute-by-minute simultaneous call audit. Actual strain depends on call duration, transport time, hospital turnaround, geography, out-of-area transfers, crew status, staffing levels, and whether one or two ambulances were actually available at the time.

Three-Period Summary

Period	Days	Total Calls	Avg Calls/Day	3+ Slots	% of Hours	Excess > 2	3+ Rate/1K	Best 10-Hr Window
2024 full year	366	3729	10.19	107	1.2%	120	12.2	09:00-18:59
2025 full year	365	3569	9.78	90	1.0%	105	10.3	10:00-19:59
2026 YTD	146	1465	10.03	50	1.4%	63	14.3	09:00-18:59
Combined	877	8763	9.99	247	1.2%	288	11.7	09:00-18:59

Interpretation: The combined three-period result supports 09:00-18:59 as the best 10-hour planning window. The 2026 YTD best 10-hour window also remains 09:00-18:59, which reinforces the prior two-year conclusion rather than replacing it.

2026 YTD Trajectory Compared with Prior Same-Period Average

Measure	2024 Same Period	2025 Same Period	2024-2025 Avg.	2026 YTD
Total medical calls	1482	1410	1,446	1465
Average calls/day	10.08	9.66	9.87	10.03
3+ call hour-slots	39	33	36	50
Excess above two ambulances	43	39	41	63
3+ overload rate / 1,000 hrs	11.1	9.4	10.2	14.3
Excess-demand rate / 1,000 hrs	12.2	11.1	11.7	18.0

The 2026 YTD call total is only +1.3% compared with the 2024-2025 same-period average, but 3+ call hour-slots are +38.9% and excess demand above two ambulances is +53.7%. This means the 2026 issue is not just more calls; it is more calls clustering into the same hour.

If the 2026 YTD pattern continued on a straight-line basis for a full 365-day year, it would project to approximately 3,662 medical calls, 125 3+ hour-slots, and 158 excess call-units above the two-ambulance baseline. The projection should not be treated as a forecast, but it shows that the current trajectory is more strained than either 2024 or 2025.

Hour-of-Day Findings

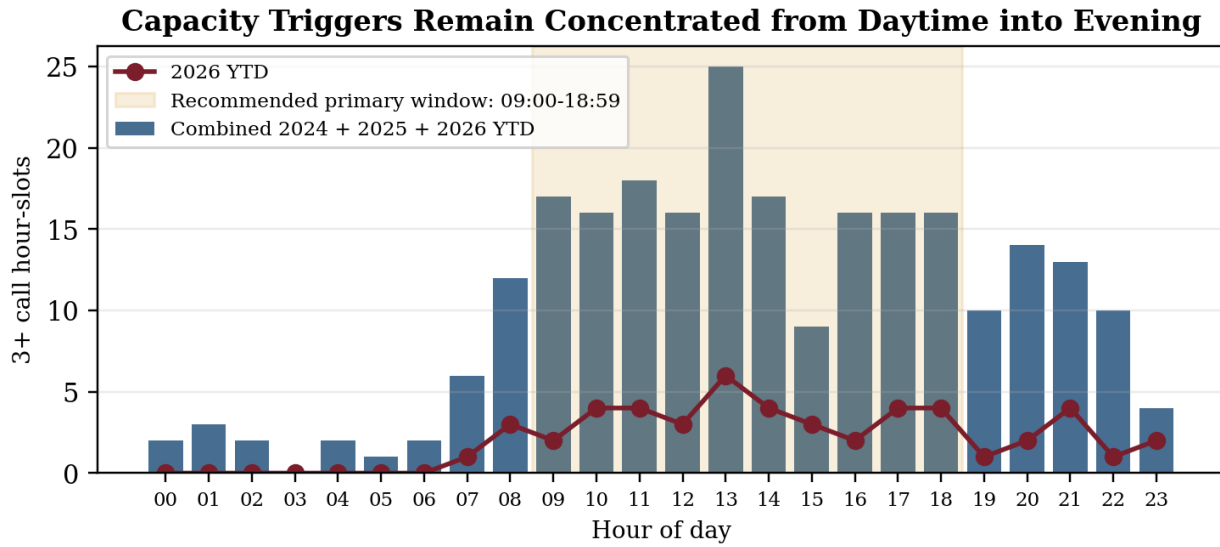


Figure 2. The combined data and 2026 YTD data continue to concentrate overload from daytime into early evening.

The strongest all-period overload hours are concentrated between 09:00 and 21:59, with the highest combined recurring pressure at 13:00, 11:00, 14:00, 09:00, 10:00, 16:00, 17:00, and 18:00. The 2026 YTD data is consistent with this general pattern, while also showing enough evening pressure to keep the broader surge period important.

Rank	Hour	Combined 3+	Combined Excess	2026 YTD 3+	2026 YTD Excess
1	13:00-13:59	25	30	6	10
2	11:00-11:59	18	22	4	4
3	14:00-14:59	17	21	4	4
4	09:00-09:59	17	18	2	2
5	10:00-10:59	16	21	4	5
6	16:00-16:59	16	19	2	2
7	17:00-17:59	16	18	4	5
8	18:00-18:59	16	18	4	4
9	12:00-12:59	16	16	3	3
10	20:00-20:59	14	16	2	3

Coverage Window Comparison

Window	Hours	Combined 3+	% 3+	Combined Excess	% Excess	2026 YTD Excess
09:00-14:59	6	109	44.1%	128	44.4%	28
09:00-16:59	8	134	54.3%	161	55.9%	34
09:00-18:59	10	166	67.2%	197	68.4%	43
10:00-19:59	10	159	64.4%	190	66.0%	42
09:00-20:59	12	190	76.9%	224	77.8%	47
10:00-21:59	12	186	75.3%	223	77.4%	52

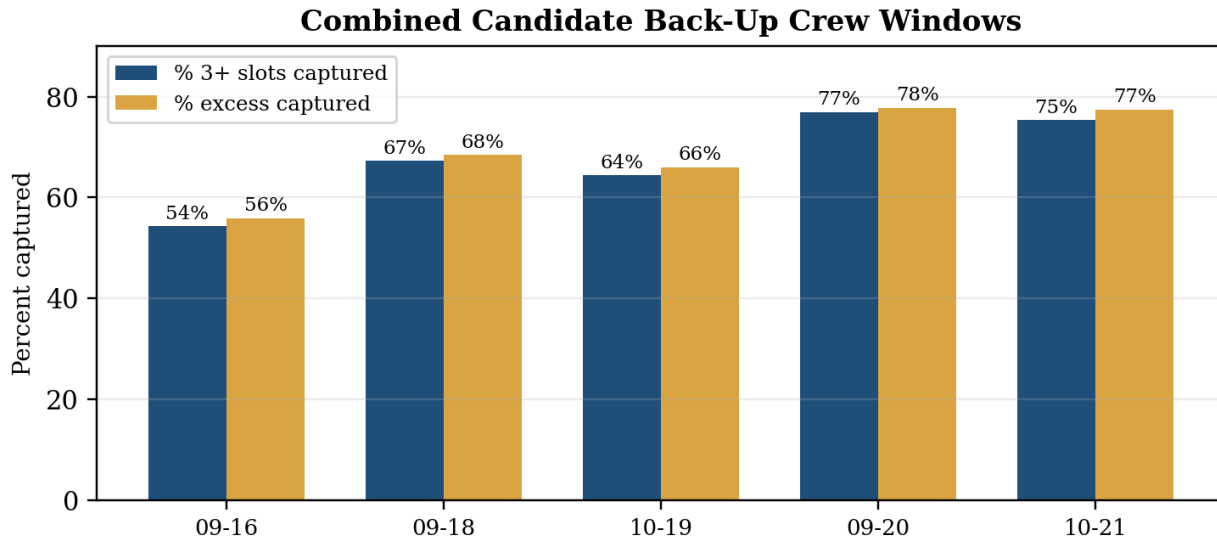


Figure 3. The combined dataset keeps 09:00-18:59 as the strongest 10-hour primary window; 09:00-20:59 remains the best broader surge period.

Operational interpretation: 09:00-18:59 is still the best balanced primary window when all three periods are combined. The 2026 trend does not justify moving the primary recommendation later, but it does justify a stronger evening surge/on-call design. The 10:00-21:59 window performs best as a 2026 YTD 12-hour window, so it should be considered for special-event days, weekends, and days with known reduced baseline availability.

Weekday vs. Weekend Update

Period	Days	Total Calls	Avg Calls/Day	3+ Slots	Excess	3+ Rate/1K Hrs
All periods - Weekdays	627	6467	10.3	189	220	12.6
All periods - Weekends	250	2296	9.2	58	68	9.7
2026 YTD - Weekdays	104	1062	10.2	36	44	14.4
2026 YTD - Weekends	42	403	9.6	14	19	13.9

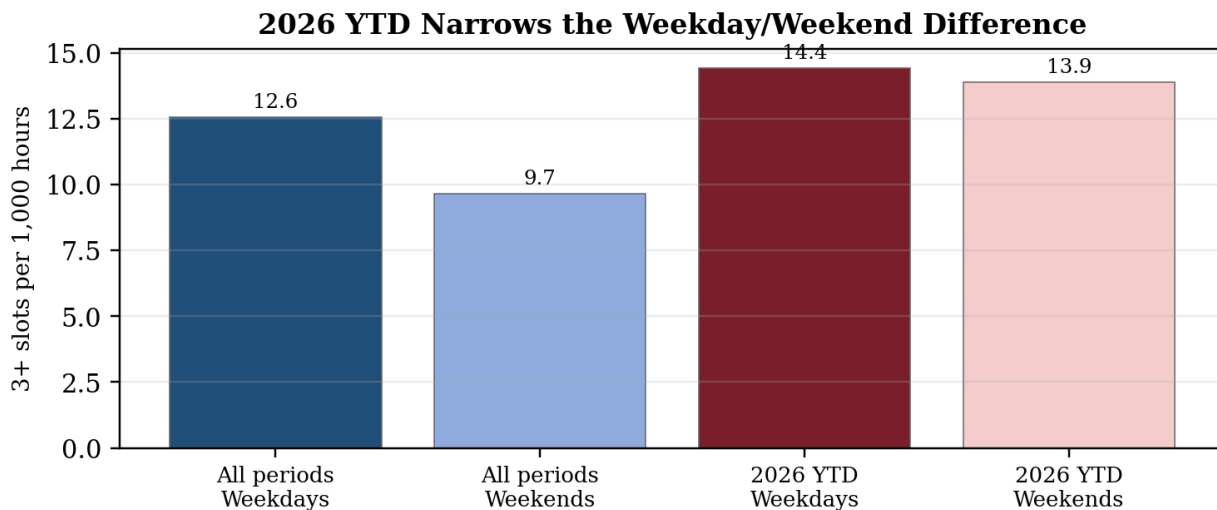


Figure 4. The all-period dataset remains weekday-heavy, but 2026 YTD narrows the weekday/weekend gap.

The all-period dataset still supports a weekday-focused regular staffing strategy. However, 2026 YTD changes the weekend discussion. Weekends are no longer easy to describe as low-risk because the 2026 YTD weekend overload rate is nearly

equal to the weekday rate, and the 2026 YTD weekend excess-demand rate is slightly higher. This finding supports keeping weekends in a surge/on-call posture instead of excluding them from the back-up crew strategy.

One-Unit Availability Sensitivity

The primary study uses 3+ calls per hour because two ambulances are the typical planning baseline. However, when only one ambulance is available, the operational risk begins at 2+ calls in the same hour. This matters because the local system has noted that two ambulances are typical, but actual availability is sometimes less.

Rank	Hour	Combined 2+	Combined Excess >1	2026 YTD 2+	2026 YTD Excess >1
1	10:00-10:59	114	135	19	24
2	11:00-11:59	110	132	18	22
3	13:00-13:59	104	134	16	26
4	09:00-09:59	100	118	15	17
5	16:00-16:59	93	112	12	14
6	17:00-17:59	89	107	17	22
7	08:00-08:59	83	98	13	18
8	12:00-12:59	80	96	13	16
9	15:00-15:59	77	91	13	17
10	18:00-18:59	74	92	9	13

The one-unit sensitivity points to the same general daytime and early-evening risk period. The strongest combined 2+ risk hours are 10:00, 11:00, 13:00, 09:00, 16:00, and 17:00. This reinforces that the back-up crew should not be treated only as a third-call resource; it also functions as a system protection measure when one of the normal two ambulances is already unavailable.

Updated EMSAC Recommendation Based on 2026 Trend

The 2026 YTD data strengthens the prior EMSAC recommendation. It does not create a different primary window; it changes the implementation posture from a general planning concept toward a more urgent system-capacity priority.

- Primary recommendation: establish a reliable third ambulance/back-up crew capability from 09:00-18:59.
- Implementation priority: begin with weekdays because the all-period dataset remains weekday-heavy, but keep weekend surge/on-call availability in the plan because 2026 YTD narrows the weekday/weekend gap.
- Lower-cost phase-in: if a 10-hour resource is not feasible immediately, begin with 09:00-16:59 and require a defined surge/on-call extension into the evening.
- Broader surge posture: use 09:00-20:59 as the standard surge/on-call window; consider 10:00-21:59 on weekends, special-event days, weather-risk days, and days when the system starts below two-unit availability.
- Reduced-availability trigger: when only one ambulance is available, treat 2+ calls in an hour as the operational warning threshold and activate contingency coverage early.
- Measurement requirement: track call duration, unit-hour availability, simultaneous dispatches, hospital turnaround, mutual-aid use, interfacility transfers, and delayed responses so EMSAC can move from call-count planning to a true reliability model.

Recommended Policy Statement

Wapello County EMSAC should recognize third ambulance/back-up crew capability as a system resilience priority. Based on the 2024, 2025, and 2026 YTD medical call-hour analysis, the preferred planning and implementation target is reliable third ambulance/back-up crew availability from 09:00-18:59. The 2026 YTD trend does not change the primary window, but it strengthens the urgency for action because capacity strain is increasing through call concurrency rather than simple total call volume growth.

Adopted primary window	09:00-18:59
Most defensible phase-in	09:00-16:59, paired with evening surge/on-call coverage
Best standard surge period	09:00-20:59
2026 trend-sensitive surge option	10:00-21:59 for weekends, high-risk days, special events, and reduced-availability days
Weekday/weekend conclusion	Regular coverage should prioritize weekdays, but weekends must remain in the surge model because 2026 YTD narrowed the gap.
Two-ambulance baseline caution	The back-up crew should strengthen the two-ambulance baseline, not replace it.
Three-period conclusion	The recommendation stays centered on 09:00-18:59, but 2026 strengthens the implementation case.

Limitations and Follow-Up Data Needs

This report uses hourly call counts. It does not by itself show precise call overlap, call duration, transport time, hospital turnaround, out-of-county transfers, cancelled calls, mutual-aid response, geography, or actual unit status. These factors may increase or reduce the operational meaning of a 3+ call hour.

The next level of analysis should combine these hourly call counts with dispatch timestamps, unit status, response times, transport times, hospital wall time, mutual-aid requests, cancelled calls, staffing levels, and periods when only one ambulance was actually available. That would allow EMSAC to validate the third ambulance/back-up crew model using service reliability metrics rather than demand counts alone.

Source Data

Source data: 2024 Calls per hour.xlsx, 2025 calls per hour.xlsx, and 2026 calls per hour.xlsx. The 2026 dataset covers January 1 through May 26, 2026 and should be interpreted as year-to-date data, not a complete calendar year.