OPTIMAL DEPLOYMENT SCIENCE

COST-BENEFIT ANALYSIS OF SANTA BARBARA COUNTY FIRE DEPARTMENT EMS SERVICES AS A SUBCONTRACT UNDER AMR

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COST-BENEFIT ANALYSIS OF
SANTA BARBARA COUNTY FIRE DEPARTMENT EMS SERVICES
AS A SUBCONTRACT UNDER AMR

Approval
NOT RECOMMENDED

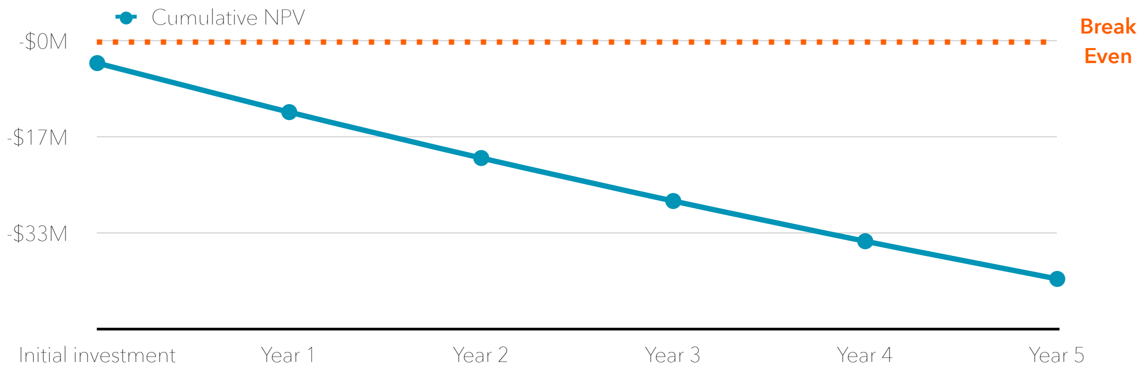
SUMMARY

This financial analysis concludes that the proposed project is **not financially viable**. The Net Present Value (NPV) remains **negative** throughout the contract period, with a projected **$41 million loss** and **no break-even point**. Even in optimistic revenue scenarios, costs exceed earnings. Given this financial shortfall and the inability to generate positive returns above the **4.22%**[1] risk-free rate, this project is financially unsustainable and **not recommended**.

Investment Period (excluding extensions)	Risk Free Rate	Net Present Value (NPV)	Internal Rate of Return (IRR)	Break-Even Date
5 Years	4.22%	-$41,158,078.68	N/A	N/A

Financial Viability Analysis

The investment **never becomes sustainable**, showing **weak** financial viability. If external market conditions remain stable, the projected cash flow suggests sustained **negative** returns into the future.



This chart shows the projected cumulative NPV, highlighting the break-even threshold (not reached within analysis period). The solid line represents NPV and the dotted line is the break-even threshold.

[1] March 3, 2025 10-year U.S. Treasury Note

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INTRODUCTION

Purpose

Effective and efficient ambulance deployment is critical for timely emergency response and financial sustainability. This report provides an evidence-based framework for optimizing ambulance availability and deployment by examining revenue, expenses, risks, and cost-benefit relationships. By quantifying operational and financial performance, this report delivers an actionable recommendation to accept or reject the proposed configuration.

Scope

This report focuses on the financial implications of the proposed ambulance deployment model. It provides a structured assessment of projected revenues, costs, financial risks, and cost-benefit relationships, ensuring that decision-making is based on objective financial data.

This analysis evaluates financial sustainability, not governance, operational control, or contractual risk. A governance assessment would likely reveal additional risks and costs.

The report **includes**:

1. Production Analysis
   - Temporal Demand & Schedule
   - Resources Needed
2. Production Expenses
   - Initial and Recurring Expenses
   - Labor and Non-labor Costs
3. Transport Analysis
   - Seasonal Analysis
   - Multi-year Forecast
   - Annual Patient Transport Estimates
4. Transport Revenue
   - Billed Charges
   - Realized Revenue
5. Cost-Benefit Analysis
   - Net Present Value
   - Break-even Point

The report **does not include**:

1. Governance Assessment
   Administrative control structures, contractual compliance risks, legal oversight, or liability concerns
2. Public Outreach & Education
   Community education or prevention programs
3. Communications
   Nurse Navigation or Telemedicine
4. First Response
   Any fire-based first response operations
5. Patient Transport
   Interfacility Transport (IFT), Critical Care Transport (CCT), Tactical, or Mental Health Transport
6. Definitive Care
   Hospital or post-transport patient care

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Context

Emergency Medical Services (EMS) agencies operate in an increasingly complex environment where resource availability, equitable and timely response, and financial sustainability must all be addressed. The challenge is not just having ambulances available, but deploying them strategically to optimize coverage, minimize delays, and ensure fiscal sustainability.

Many agencies rely on historical call volumes, static post locations, or generalized practices to guide deployment decisions. However, without a structured, data-driven approach, agencies risk inefficiencies, unnecessary costs, and suboptimal response times.

This report is designed to address these challenges by providing a quantifiable framework for evaluating an ambulance deployment. By integrating financial data, operational metrics, and risk analysis, it offers actionable insights that fuel informed decisions about system optimization.

The findings in this report are intended to support decision-makers, policymakers, and operational leaders in making a "Go"/"No Go" decision based on the financial implications of the proposed deployment.

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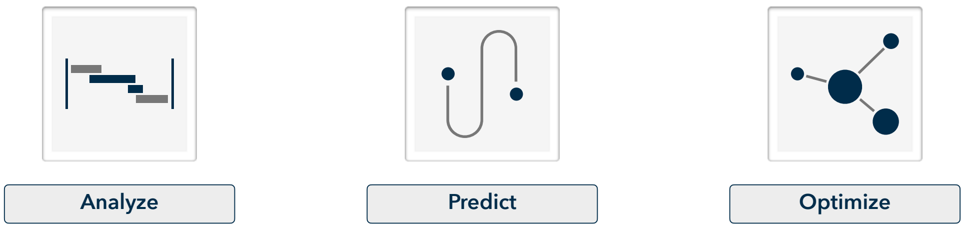
PRODUCTION ANALYSIS

Methodology

The *Production Analysis* determined the optimal EMS deployment by analyzing historical activity. Unlike conventional methods that rely on hourly call volume, this analysis applied time series analytics techniques to assess concurrent resource utilization—the number of ambulances in use at any given moment. By leveraging the Victor Reporting Engine, the analysis identified real-time demand fluctuations and provided a more accurate foundation for deployment modeling.



Step 1: Analyze the Past

EMS activity was evaluated using time series analytics to identify demand patterns and system load. This step assessed:

- **Temporal Utilization:** Ambulance usage was measured at sub-second resolution to capture real-time demand fluctuations.
- **Geospatial Distribution:** Incident locations were mapped to highlight high-demand areas, underserved zones, and coverage gaps.
- **Operational Metrics:** Response times, unit workload, and deployment efficiency were analyzed to assess overall system performance.

Step 2: Predict the Future

Conventional approaches predict future call volume but did not account for required resources—a critical distinction. Where possible, this analysis identified patterns in resource serviceability and utilization using scientifically validated statistical methods. These metrics were quantified and processed to produce short- and long-term forecasts of future resource requirements.

Step 3: Optimize Readiness

The final step identified the optimal statistical model for EMS deployment and used it to generate a data-driven schedule.

- **Schedule Optimization:** The prediction model produced a 168-hour report, which was analyzed to develop an optimized schedule that aligns personnel and unit availability with projected demand.
- **Resource Allocation:** The schedule determined the necessary employee headcount and vehicle requirements, ensuring resources were neither underutilized nor overextended.

Findings: Zone 4 - Lompoc

The *Production Analysis* found that EMS demand varied throughout the week, requiring an adaptive scheduling approach. An optimized schedule was developed to maintain alignment between EMS demand and resource deployment.

Temporal Demand

The normal high for ambulance utilization occurred on **most weekdays**, with demand reaching **four (4)** ambulance simultaneously.

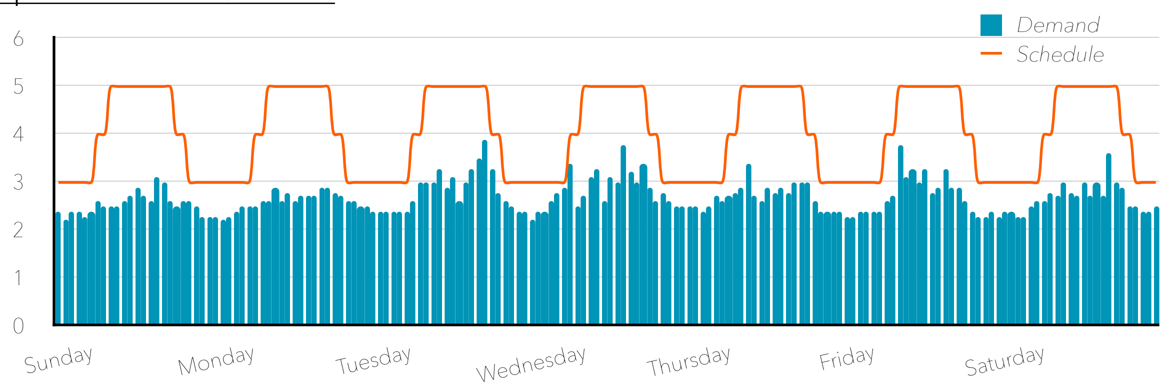
Resource utilization dropped during **overnight hours**, with normal concurrent demand of **two (2)** units.

Schedule Alignment

The optimized schedule aligns unit availability with demand fluctuations, providing sufficient coverage during peak hours while minimizing excess capacity.

Scheduled units fluctuate between **three (3) and five (5)** activated at any time, totaling **672 hours** each week.

Temporal Demand & Schedule



This chart illustrates how demand (blue) and scheduled resources (orange) fluctuate over the week.

Resource Requirements

The optimized schedule above requires **26 full-time personnel** and **7 vehicles**, including all necessary equipment and supplies, are required to sustain effective operations.

Personnel	Vehicles
26	**7**

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Findings: Zone 6 - South Coast

The *Production Analysis* found that EMS demand varied throughout the week, requiring an adaptive scheduling approach. An optimized schedule was developed to maintain alignment between EMS demand and resource deployment.

Temporal Demand

The normal high for ambulance utilization occurred on **Friday, Saturday, and Sunday**, with demand reaching **four (4)** ambulance simultaneously.

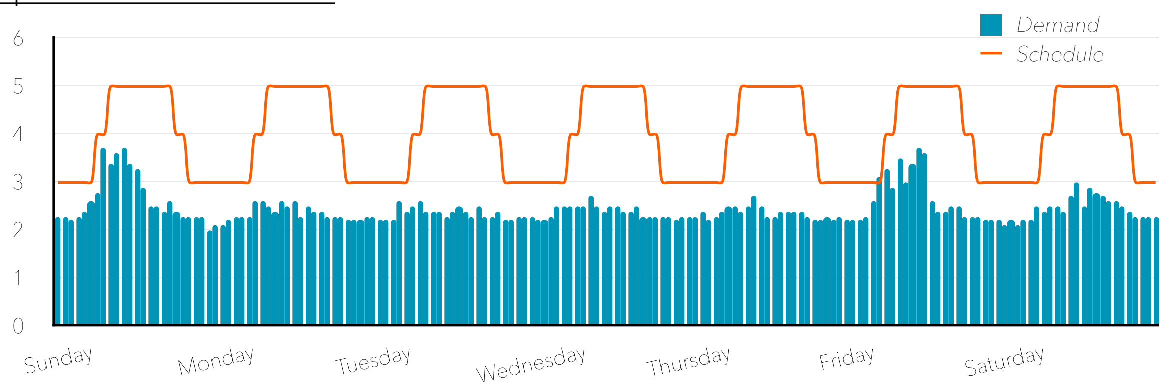
Resource utilization dropped during **overnight hours**, with normal concurrent demand of **two (2)** units.

Schedule Alignment

The optimized schedule aligns unit availability with demand fluctuations, providing sufficient coverage during peak hours while minimizing excess capacity.

Scheduled units fluctuate between **three (3) and five (5)** activated at any time, totaling **672 hours** each week.

Temporal Demand & Schedule



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Resource Requirements

The optimized schedule above requires **26 full-time personnel** and **7 vehicles**, including all necessary equipment and supplies, are required to sustain effective operations.

Personnel	Vehicles
26	**7**

These staffing and vehicle requirements form the baseline for *Production Expenses*, ensuring financial planning is directly tied to operational demand rather than static assumptions.

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PRODUCTION EXPENSES

Methodology

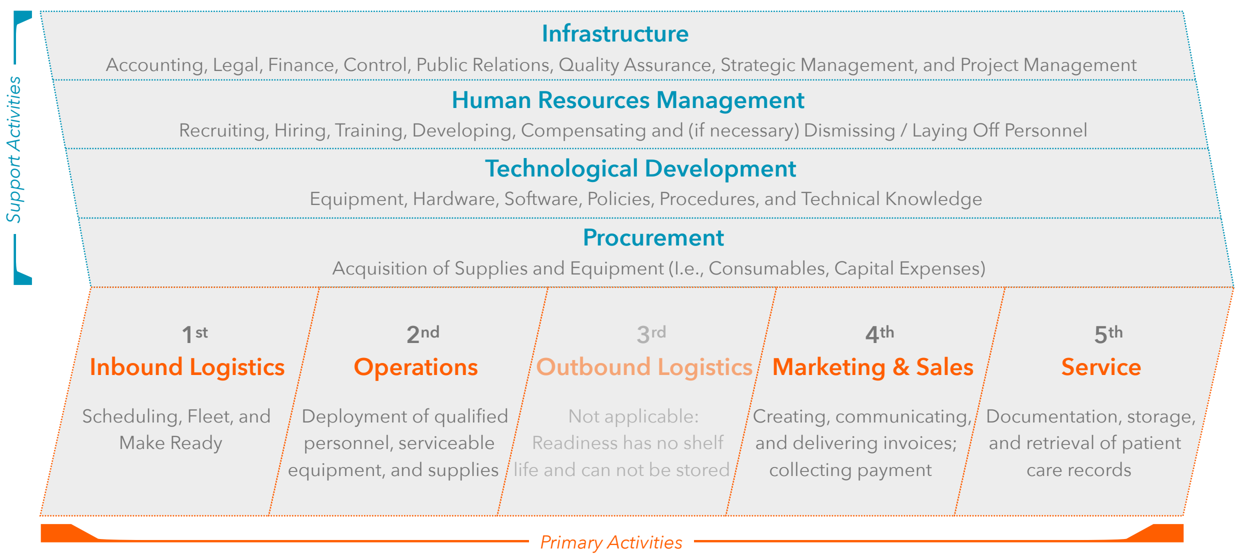
The *Production Analysis* identified fleet size and field FTEs as the primary cost drivers, forming the baseline operational footprint. All additional costs—including medical supplies, equipment, administrative overhead, and facility expenses—were quantified from this foundation.

The Value Chain

To structure the expense analysis, this methodology aligns with Michael Porter's Value Chain, which categorizes costs into:

- **Primary Activities:** Direct service costs such as personnel deployment and fleet management.
- **Support Activities:** Indirect functions like procurement, technology, and administrative oversight.

This framework ensures that every expense is mapped to its operational role, providing a clear distinction between essential service costs and overhead expenditures.



The Value Chain with Primary Activities in orange and Support Activities in blue. Annotations apply to specifically to EMS.

Bottom-Up Cost Estimation

A bottom-up approach was used to determine total deployment costs. Unlike high-level cost projections that rely on broad assumptions, a bottom-up estimate:

1. **Identifies each component** for the entire deployment (e.g., vehicles, staffing, consumables).
2. **Assigns precise cost estimates** to each component based on historical data and supplier quotes.
3. **Aggregates all costs** to calculate total implementation and recurring expenses.

This eliminates reliance on arbitrary assumptions, ensuring repeatability and financial accuracy.

Findings: Combined

The analysis of *Production Expenses* identified one-time implementation costs and recurring annual costs, forming the financial foundation for deployment and supporting operational requirements.

One-Time	Recurring
$3,736,527.73	**$13,225,880.02**

A detailed breakdown of non-labor and labor expenses is provided below, ensuring financial planning aligns with operational demand.

Non-Labor Expenses

Non-personnel	One-Time		Recurring	
Logistics	**$**	**3,403,807.77**	**$**	**1,874,941.84**
Clothing and			$	180,285.00
Fleet			$	236,300.00
Training			$	665.00
Radios	$	176,437.50	$	2,400.00
Vehicles,	$	3,227,370.27	$	1,047,611.84
Preventative			$	407,680.00
Operations			**$**	**39,136.00**
Training			$	39,136.00
Marketing & Sales			**$**	**575.00**
Training			$	575.00
Service			**$**	**1,250.00**
Training			$	1,250.00
Infrastructure	**$**	**226,076.00**	**$**	**2,311,737.58**
Books and Training			$	71,137.50
Contracts and			$	1,234,069.18
Food and Rehab			$	1,595.40
Licenses,			$	716,000.00
Training			$	240,880.00
Radios	$	35,000.00		
Office Supplies and			$	33,607.50
Station	$	191,076.00	$	14,448.00
Human Resources			**$**	**12,667.00**
Training			$	1,100.00
Recruitment			$	1,000.00
Onboarding			$	2,000.00
Retention			$	8,567.00
Technology	**$**	**106,643.96**	**$**	**352,757.18**
Administration	$	106,643.96		
Licenses,			$	339,057.18
Training			$	100.00
Office Supplies and			$	13,600.00
Procurement			**$**	**1,165.00**
Professional				
Training			$	1,165.00
Grand Total	**$**	**3,736,527.73**	**$**	**4,594,229.6**

Labor Expenses

Personnel	FTE Counts	Subtotals	
Logistics	**1.33**	**$**	**146,167.75**
Supervisor	0.33	$	56,405.35
Individual	1	$	89,762.40
Operations	**59.5**	**$**	**7,376,567.72**
Director	1	$	202,103.77
Manager	0.5	$	82,993.23
Supervisor	6	$	968,357.1
Individual	52	$	6,123,113.62
Marketing & Sales	**1.15**	**$**	**100,611.36**
Supervisor	0.15	$	25,809.36
Individual	1	$	74,802.00
Service	**2.5**	**$**	**166,411.16**
Individual	2.5	$	166,411.16
Infrastructure	**1.46**	**$**	**241,902.41**
Officer	0.48	$	76,218.92
Director	0.15	$	38,782.99
Manager	0.33	$	97,368.78
Individual	0.5	$	29,531.72
Human Resources	**2.2**	**$**	**247,568.04**
Manager	0.2	$	37,911.46
Individual	2	$	209,656.58
Technology	**0.2**	**$**	**43,737.52**
Manager	0.2	$	43,737.52
Procurement	**2.33**	**$**	**308,684.45**
Manager	0.33	$	66,532.84
Supervisor	1	$	152,389.21
Individual	1	$	89,762.40
Grand Total	**70.67**	**$**	**8,631,650.42**

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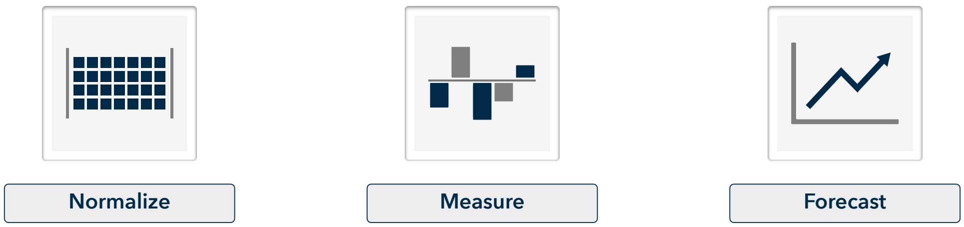
TRANSPORT ANALYSIS

Methodology

The *Transport Analysis* evaluated historical transport data to identify seasonal patterns and long-term trends. This assessment used Computer-Aided Dispatch (CAD) data to quantify monthly variations in transport volume while controlling for differences in month length.



<u>Step 1: Normalize</u>

Normalization adjusted for variability in month length, accounting for fluctuations in transport volume to ensure seasonal patterns were accurately captured without distortion.

- **Why this matters:** Comparing raw monthly totals can misrepresent trends. For example, a month with 31 days will naturally have more transports than one with 28, even if demand is stable.
- **Impact:** This normalization ensured that observed variations were due to true seasonal patterns rather than inconsistencies in calendar structure.

<u>Step 2: Measure</u>

A Seasonal Index was derived to quantify recurring fluctuations influenced by weather, holidays, and population shifts. This step identified cyclical patterns in demand, distinguishing between short-term anomalies and true seasonal trends.

- **Why this matters:** Predictable demand changes (e.g., flu season, holidays) must be separated from random anomalies (e.g., natural disasters).
- **Impact:** This provided a baseline expectation for transport demand each month, ensuring projections were based on historical seasonality rather than assumptions.

<u>Step 3: Forecast</u>

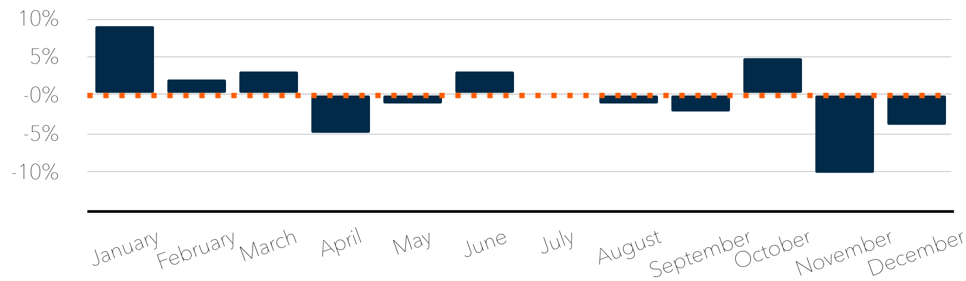
The seasonal index was combined with long-term trend analysis, integrating calculations to project future transport demand. The resulting model accounted for both cyclical and directional changes, providing a data-driven foundation for forecasting and resource planning.

- **Why this matters:** Demand trends are influenced by both seasonal cycles and broader directional shifts. Without both factors, forecasts risk being incomplete.
- **Impact:** The final forecast provides a realistic projection of future demand, ensuring that staffing, fleet availability, and operational planning align with actual transport needs.

Findings: Zone 4 - Lompoc

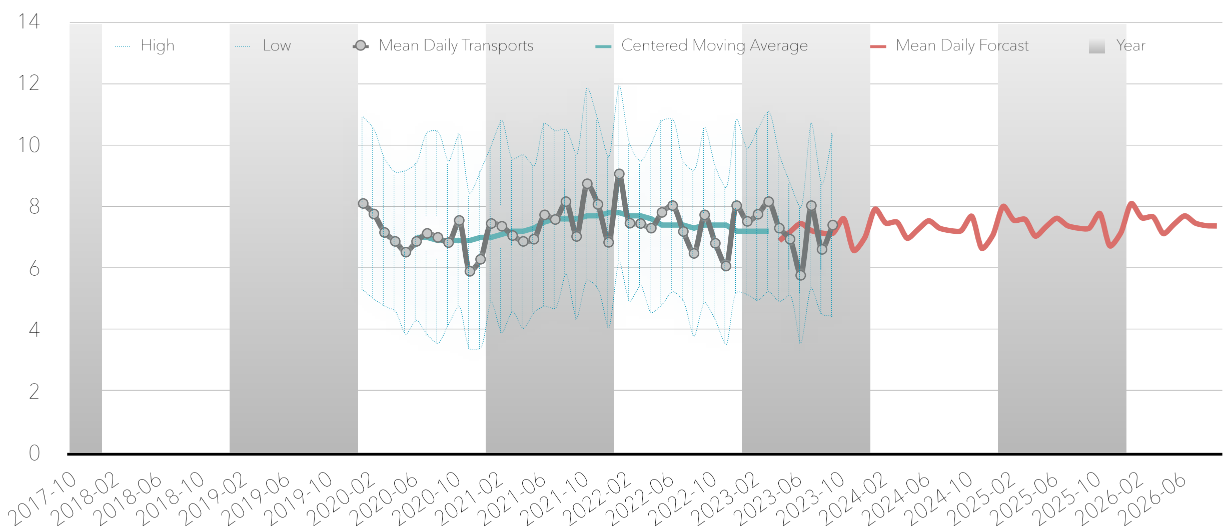
Seasonality

The chart below illustrates recurring transport patterns influenced by weather, holidays, and annual trends. Seasonal fluctuations highlight peak demand periods and times of reduced activity.



Forecast

Projected transports are expected to **increase** by **0.825%** annually, reflecting seasonal trends and long-term **growth**.



Expected Transport Counts

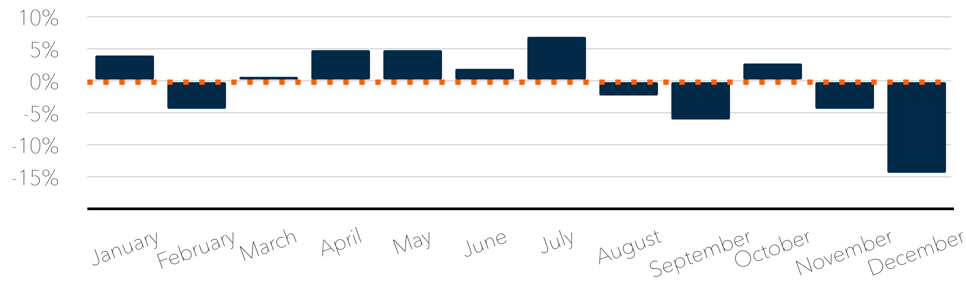
The table below presents projected annual transport volumes based on historical trends and seasonal adjustments.

Year 1 Patient Transports	Year 2 Patient Transports	Year 3 Patient Transports	Year 4 Patient Transports	Year 5 Patient Transports
2,678	**2,700**	**2,723**	**2,745**	**2,768**

Findings: Zone 6 - South Coast

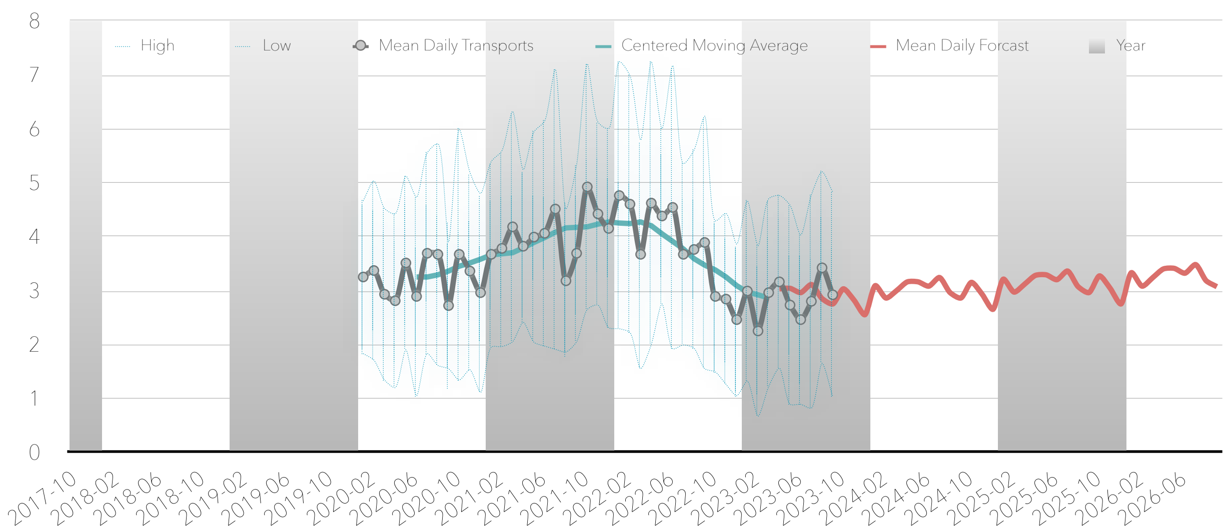
Seasonality

The chart below illustrates recurring transport patterns influenced by weather, holidays, and annual trends. Seasonal fluctuations highlight peak demand periods and times of reduced activity.



Forecast

Projected transports are expected to **increase** by **3.554%** annually, reflecting seasonal trends and long-term **growth**.



Expected Transport Counts

The table below presents projected annual transport volumes based on historical trends and seasonal adjustments.

Year 1 Patient Transports	Year 2 Patient Transports	Year 3 Patient Transports	Year 4 Patient Transports	Year 5 Patient Transports
1,106	**1,146**	**1,186**	**1,228**	**1,272**

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TRANSPORT REVENUE

Methodology

A bottom-up revenue estimate was applied using transport volume findings from the *Transport Analysis* to calculate EMS transport revenue. Revenue determination was based on the system's approved Service Fee Schedule, including maximum allowable payments from Medicare, Medicaid, and Tricare, as well as add-on options such as QAF and PPIGT.

Payor Mix | **Acuity Mix** | **Collection Rate**

Payor Mix

The payor mix represents the distribution of revenue across private insurance, Medicare, Medicaid, and self-pay, each with its own reimbursement rate. Variations in payor mix directly impact overall revenue potential.

Acuity Mix

Patient transports were classified by medical intervention according to Centers for Medicare & Medicaid Services (CMS) billing guidelines. Categories included BLS, ALS-1, ALS-2, and Specialty Care Transport (SCT).

Collection Rate

The collection rate measures the percentage of billed charges that are successfully recovered. Higher collection rates reflected greater billing efficiency and directly impacted total revenue.

Revenue Estimation

Annual revenue was calculated by applying the Payor Mix, Acuity Mix, and Collection Rate to expected transport volumes, ensuring a structured, data-driven estimate.

The Payor Mix determined revenue distribution across private insurance, Medicare, Medicaid, and self-pay, each with different reimbursement rates. The Acuity Mix classified transports into service groups (BLS, ALS-1, ALS-2, and SCT), each with a distinct billing rate determined by payor type. Finally, the Collection Rate represented the percentage of billed charges successfully recovered, shaping actual revenue received.

These factors collectively determined billed charges and actual revenue received, ensuring financial planning aligned with real-world reimbursement dynamics.

Findings: Zone 4 - Lompoc

EMS transport revenue was calculated using the Payor Mix, Acuity Mix, and Collection Rate, producing an estimated **$4,191,629.96** in accounts receivable and **$2,809,244.47** in total revenue.

Key Revenue Drivers

Revenue distribution across Medicare, Medicaid, private insurance, military, and self-pay reflects significant variation in reimbursement rates:

- **Private insurance** yielded the **highest per-transport revenue**, though it accounted for a smaller share of total transports.
- **Medicare and Medicaid** accounted for the **largest share of total transports** but at lower reimbursement rates.

The Acuity Mix played a key role in revenue generation, with higher-acuity transports contributing a disproportionate share of total revenue:

- **ALS-1 Emergency transports** accounted for **a disproportionate** share of total revenue due to higher reimbursement rates.
- **BLS-Emergency transports** produced **lower per-transport revenue** due to reduced billing rates across all payor types.

Revenue Estimates

The table below details revenue by payor source and service type, illustrating the impact of billing rates, transport volume, and collection rates on total earnings.

Short Description	Employer	Non-Group	Medicaid	Medicare	Military	Uninsured	Total
Ambulance 02 life	$ 5,893.99		$ 873.27			$ 211.87	$ 6,979.13
Extra ambulance							
Ground mileage	$ 103,982.96		$ 18,637.88	$ 70,460.67	$ 945.53	$ 3,737.85	$ 197,764.89
Als 1							
Als1-emergency	$ 798,364.15		$ 838,799.19	$ 708,969.16	$ 9,513.81	$ 28,698.59	$ 2,384,344.90
Bls							
Bls-emergency	$ 57,656.87		$ 93,199.91	$ 66,336.02	$ 890.18	$ 2,072.58	$ 220,155.56
Fixed wing air							
Rotary wing air							
Pi volunteer							
Als 2							
Specialty care							
Fixed wing air							
Rotary wing air							
Unlisted							
Total	$ 965,897.97		$ 951,510.25	$ 845,765.85	$ 11,349.52	$ 34,720.89	$ 2,809,244.48

Revenue Estimate
$2,809,244.48

Estimate of total dollars collected

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Findings: Zone 6 - South Coast

EMS transport revenue was calculated using the Payor Mix, Acuity Mix, and Collection Rate, producing an estimated **$2,436,319.05** in accounts receivable and **$1,498,084.82** in total revenue.

Key Revenue Drivers

Revenue distribution across Medicare, Medicaid, private insurance, military, and self-pay reflects significant variation in reimbursement rates:

- **Private insurance** yielded the **highest per-transport revenue**, though it accounted for a smaller share of total transports.
- **Medicare and Medicaid** accounted for the **largest share of total transports** but at lower reimbursement rates.

The Acuity Mix played a key role in revenue generation, with higher-acuity transports contributing a disproportionate share of total revenue:

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Revenue Estimates

The table below details revenue by payor source and service type, illustrating the impact of billing rates, transport volume, and collection rates on total earnings.

Short Description	Employer	Non-Group	Medicaid	Medicare	Military	Uninsured	Total
Ambulance 02 life	$ 4,207.99		$ 173.74			$ 118.81	$ 4,500.54
Extra ambulance							
Ground mileage	$ 185,595.54		$ 9,270.28	$ 88,712.68	$ 88.10	$ 5,240.03	$ 288,906.63
Als 1							
Als1-emergency	$ 569,988.89		$ 166,883.88	$ 357,047.72	$ 354.57	$ 16,092.83	$ 1,110,367.89
Bls							
Bls-emergency	$ 41,163.89		$ 18,542.65	$ 33,407.83	$ 33.18	$ 1,162.20	$ 94,309.75
Fixed wing air							
Rotary wing air							
Pi volunteer							
Als 2							
Specialty care							
Fixed wing air							
Rotary wing air							
Unlisted							
Total	$ 800,956.31		$ 194,870.55	$ 479,168.23	$ 475.85	$ 22,613.87	$ 1,498,084.81

Revenue Estimate
$1,498,084.81

Estimate of total dollars collected

COST-BENEFIT ANALYSIS

<u>Methodology</u>

The Cost-Benefit Analysis evaluated the financial viability of the EMS system by calculating its Net Present Value (NPV) over the contract period. This approach determined whether projected revenues would exceed costs, accounting for annual cash flows and the time value of money. By discounting future cash flows, NPV provides a structured measure of long-term financial sustainability.

<u>Step 1: Determine Cash Flows</u>

Annual cash flows were estimated by combining *Transport Revenue* findings with *Production Expenses*, ensuring all expected costs and earnings were incorporated.

<u>Step 2: Apply Discount Rate</u>

A discount rate was applied to future cash flows to reflect opportunity cost and inflation, accounting for the decreasing value of money over time.

<u>Step 3: Calculate Net Present Value</u>

Future cash flows were discounted to determine NPV, providing a financial benchmark for evaluating system viability over the contract period.

NPV Interpretation

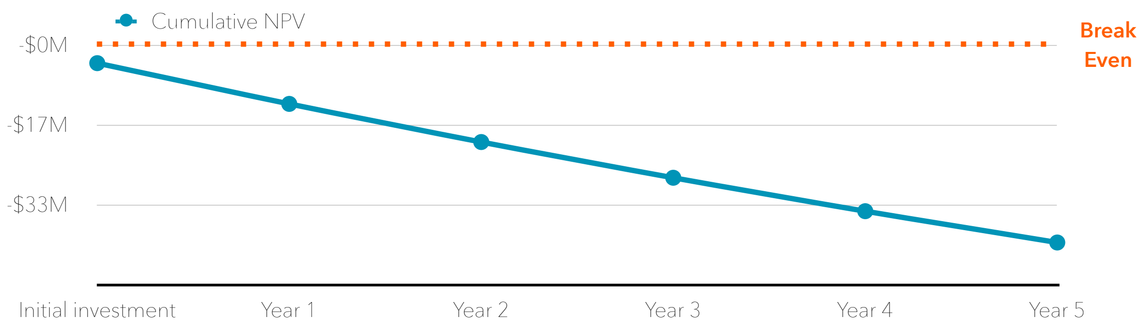
- **Positive NPV (> $0.00):** The system is projected to generate more financial value than its costs.
- **Negative NPV (< $0.00):** The system is not financially sustainable without adjustments.

> NPV relies on assumptions about future cash flows, which remain uncertain. Variability in reimbursement rates, operational costs, and economic conditions can impact the accuracy of projections.

Findings

The Cost-Benefit Analysis assessed the Net Present Value (NPV) trajectory over the contract period. The results indicate:

- **The system operates at a growing financial deficit**, with cumulative NPV declining from **-$4 million in Year 1 to -$41 million by Year 5.**
- **Annual cash flow remains negative throughout**, compounding the financial shortfall over time.
- **Break-even is not projected within the contract period**, as total projected revenues remain below expected costs.



This chart shows the projected cumulative NPV, highlighting the break-even threshold (not reached within analysis period). The solid line represents NPV and the dotted line is the break-even threshold.

Net Cash Flow

Annual cash flow analysis reveals a consistent financial shortfall, with revenue failing to offset operating expenses. This results in a growing cumulative deficit over time.

- **Annual net cash flow remains negative**, contributing to the cumulative financial shortfall.
- **Operating costs exceed revenue each year**, leading to a worsening NPV deficit over time.
- **Financial sustainability** is unlikely without external funding adjustments.

Year 0 Net Cash Flow	Year 1 Net Cash Flow	Year 2 Net Cash Flow	Year 3 Net Cash Flow	Year 4 Net Cash Flow	Year 5 Net Cash Flow
-$3,736,527.73	**-$8,918,550.73**	**-$9,186,107.25**	**-$9,461,690.47**	**-$9,745,541.18**	**-$10,037,907.42**

Expanded Insights

- **The financial gap widens over time**, suggesting that without additional funding sources or cost adjustments, the system's financial sustainability remains in question.
- **Revenue growth alone is insufficient to offset costs**, as transport volume and reimbursement rates remain stable throughout the analysis period.

RECOMMENDATIONS

Based on our analysis, we **do not recommend** proceeding with the proposed EMS system **as structured**, given the **negative** financial and operational indicators affecting its long-term viability.

Approval
NOT RECOMMENDED

Key Findings Supporting This Recommendation

The project is financially unsustainable. The cumulative Net Present Value (NPV) remains negative, and projected financial losses are not recoverable under any realistic scenarios. Even under best-case revenue scenarios, operational costs outpace earnings, making financial viability unattainable. While this analysis does not assess governance, a governance review would likely expose additional financial and structural risks.

Net Present Value (NPV) Assessment

- **Negative** Cumulative NPV: The financial model shows that the cumulative NPV **remains negative** over the forecast period, indicating that **costs outweigh projected revenue**.
- Financial Viability: **Even in optimistic forecast scenarios, costs remain unrecoverable**, considering initial capital investment, ongoing operational costs, and projected revenue streams.

Revenue Sufficiency

- **Revenue generation is insufficient**: The projected revenue **does not fully offset** both start-up and operational costs.
- Payor Mix Considerations: The system is **overly dependent on lower-reimbursement sources limiting financial flexibility**.
- Supplemental Funding Impact: **Additional funding sources (e.g., QAF, PPIGT) do not provide enough revenue to sustain operations**.

Operational Considerations

- **High fixed costs present financial risk**: **Staffing, equipment, and facility investments** drive operational expenses that **are not offset by revenue**.
- **Deployment and resource allocation require modifications** to ensure cost-effective service delivery.

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IMPLEMENTATION CONSIDERATIONS

If the project moves forward—regardless of the recommendation—we strongly recommend appointing a PMI-certified Project Management Professional (PMP) to lead implementation. Adhering to professional project management principles will ensure alignment with scope, schedule, and cost while mitigating risks and optimizing outcomes.

Initiating Process Group (Laying the Foundation)

- Define project objectives, scope, and success criteria (response times, service levels, financial targets).
- Appoint a PMP-certified Project Manager to lead and oversee execution.
- Engage with stakeholders and identify all regulatory compliance requirements before advancing.

Planning Process Group (Structuring the Execution Strategy)

- Develop a Project Management Plan, including scope, schedule, budget, and risk management.
- Create a Work Breakdown Structure (WBS) covering all activities in the Value Chain.
- Define key performance indicators (KPIs), procurement timelines, and risk mitigation strategies.

Executing Process Group (Putting the Plan into Action)

- Deploy resources in phases to maintain operational control and allow for adjustments.
- Conduct staffing, training, and system testing before full-scale operations.
- Implement change management strategies to adapt to unforeseen challenges.

Monitoring & Controlling Process Group (Ensuring Performance & Compliance)

- Track project metrics including success criteria, operational efficiency, and financial performance.
- Implement quality assurance processes to maintain service reliability.
- Manage risks proactively through continuous assessment and stakeholder communication.

Closing Process Group (Ensuring Sustainability & Lessons Learned)

- Conduct a post-implementation review to assess project success against initial objectives.
- Document lessons learned to refine future EMS system deployments.
- Ensure a structured transition to long-term operational oversight.

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CONTACT INFORMATION

For further clarification on financial projections, methodology, or cost-benefit analysis, please contact the author. This report does not address governance, regulatory, or operational management inquiries.

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APPENDICES & SUPPORTING DOCUMENTS

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