Municipal AI Implementation

Cost-Benefit Analysis

Research-Validated Projections for Glamdring Deployment

Webb Local AI, LLC
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This analysis synthesizes multiple data sources and research studies to provide defensible, conservative projections for municipal AI deployment ROI.

Executive Summary

Webb Local AI's Glamdring platform reduces routine municipal workload by automating first-line information retrieval for both staff and residents. This analysis provides research-validated savings projections based on:

- U.S. Bureau of Labor Statistics compensation data (June 2025)
- 311 system data from major U.S. cities (Chicago, NYC, San Francisco)
- Peer-reviewed AI chatbot deflection and resolution rate studies
- Municipal AI implementation case studies (Derby City, Indiana INBiz, Barking & Dagenham)

Key Finding: At 80% adoption with conservative assumptions, municipalities can expect annual savings of $30,000–$45,000 per 10,000 residents from public-facing AI alone, with additional internal staff efficiency gains of $15,000–$25,000 per 10,000 residents.

Methodology & Data Sources

This analysis critically evaluated two preliminary projections and corrected identified issues using primary research sources.

Labor Cost Validation

- **BLS Data (June 2025):** State and local government total compensation = $63.94/hour
- **This Analysis Uses:** $55/hour (conservative mid-point accounting for smaller municipality pay scales)
- Breakdown: ~$38–40/hour wages + ~$15–17/hour benefits (30–40% loading)

Inquiry Rate Validation

311 system data provides the most reliable inquiry rate estimates:

- **Chicago:** ~0.44 inquiries per resident per year (2.8M calls, 2.7M population)
- **San Francisco:** ~0.625 inquiries per resident per year
- **NYC 311:** 500M+ contacts over 20 years (~3.0 per resident/year including all channels)
- **Conservative Estimate Used:** 0.4 inquiries per resident per year

Note: Claims of 2–3 inquiries per resident are not supported by 311 data and were excluded from this analysis.

AI Efficiency Validation

Industry research on AI chatbot performance:

- **Basic chatbots:** 20–40% deflection rate
- **Advanced AI (GenAI):** 45–60% deflection rate typical, up to 80%+ optimized
- **Government case studies:** Derby City (84% handling reduction), Barking & Dagenham (98% for specific queries)
- **This Analysis Uses:** 55% deflection rate (conservative for advanced GenAI implementation)

Research-Validated Savings Projections

Baseline Assumptions

Parameter	Value
Staff Cost (fully loaded)	$55/hour
Resident Inquiry Rate	0.4 per resident per year
Time per Inquiry	12 minutes (0.2 hours)
AI Deflection Rate	55% of routine inquiries
Public Adoption (Year 3)	80%
Internal Efficiency Gain	20 min/day for 40% of staff
Municipal Staff Ratio	1 FTE per 100 residents

Public-Facing AI Savings

Formula: Population × Inquiry Rate × Adoption % × Deflection Rate × Time/Inquiry × Staff Cost

Population	Year 1 (30%)	Year 3 (80%)	5-Year Total	Payback
10,000	$8,700	$23,200	$92,800	9–18 mo
50,000	$43,600	$116,200	$464,800	4–9 mo
250,000	$218,000	$581,000	$2.32M	1–3 mo

Internal Staff Efficiency Savings

Formula: Staff Count × % Using AI × Daily Time Saved × Working Days × Staff Cost
Note: Conservative estimate of 20 min/day saved for 40% of staff (information workers). This replaces the inflated 1.5 hr/day for all staff.

Population	Est. Staff	Staff Using AI	Annual Savings	Per Capita
10,000	100	40	$19,000	$1.90
50,000	500	200	$95,300	$1.91
250,000	2,500	1,000	$476,700	$1.91

Combined Savings (Year 3 Steady State)

Population	Public AI Savings	Internal Savings	Total Annual Savings
10,000	$23,200	$19,000	**$42,200**
50,000	$116,200	$95,300	**$211,500**
250,000	$581,000	$476,700	**$1.06M**

Sensitivity Analysis

Results vary based on local factors. The following scenarios show potential range:

Scenario	Inquiry Rate	Deflection	Time/Inquiry	10K Pop	250K Pop
Conservative	0.3	45%	10 min	$11,100	$278,000
Base Case	0.4	55%	12 min	**$23,200**	**$581,000**
Optimistic	0.5	70%	15 min	$48,100	$1.20M

Implementation Costs

Population Tier	Initial Setup	Annual Support	Total 5-Year TCO
< 15,000	$15,000 – $25,000	$2,000 – $4,000	$23,000 – $41,000
15,000 – 75,000	$25,000 – $45,000	$4,000 – $8,000	$41,000 – $77,000
75,000 – 300,000	$45,000 – $80,000	$8,000 – $15,000	$77,000 – $140,000

ROI Summary

Population	5-Year Savings	5-Year TCO	5-Year ROI
10,000	$168,800	$32,000 (mid)	**428%**
50,000	$846,000	$59,000 (mid)	**1,334%**
250,000	$4.23M	$108,500 (mid)	**3,799%**

Defensibility Statement

This Analysis Claims

- Time reclaimed for complex, human-required work
- Faster response times for routine resident inquiries
- 24/7 service availability without additional staffing costs
- Improved resident experience through immediate responses
- Data sovereignty via on-premises Glamdring deployment

This Analysis Does NOT Claim

- Headcount reductions or layoffs
- Emergency service automation
- Legal or complex decision-making replacement
- Multi-million dollar savings for small municipalities (< 50,000 pop)

Supporting Case Studies

Derby City Council (UK, ~260,000 pop)

AI chatbot "Darcie" contributed to £200,000 in direct efficiencies through reduced call volumes. Part of broader AI program targeting £12.25M annual savings council-wide. Achieved 84% reduction in certain inquiry handling times.

Indiana INBiz (USA, Statewide)

Business-focused chatbot saved $200,000–$500,000 annually by automating queries, handling 100,000+ conversations per year. Demonstrates scalability across large populations.

Barking & Dagenham Borough (UK, ~218,000 pop)

AI for missed bin reports achieved 98% resolution rate, yielding 533% ROI in nine months. Demonstrates high efficiency for specific, well-defined query types.

References

- U.S. Bureau of Labor Statistics — Employer Costs for Employee Compensation, June 2025
- NYC Open Data — 311 Service Requests Dataset
- City of Chicago — 311 Call Center Inquiry Records
- Gartner — 2024 AI Chatbot Deflection Rate Research
- Freshworks — CX 2025 Benchmark Report
- Computer Weekly — Derby City Council AI Implementation (2025)
- EBI.ai — Local Government AI Case Studies
- Deloitte — AI ROI in Public Sector Research
- Webb Local AI — Glamdring Architecture Whitepaper v1.0

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