



Planning and Mission Effectiveness Demographic Data History

Team MSDS 25.2

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ARCHDIOCESE
OF SEATTLE

INTRODUCTION

The Archdiocese of Seattle, serving over one million Catholics across 136 parishes in Western Washington, has been a key partner in this project. Their commitment to data-driven pastoral planning and support for student research made this work possible.

PROBLEM STATEMENT

This project supports the Archdiocese of Seattle's long-term pastoral planning by analyzing historical and current data across 136 parishes to uncover trends in engagement, growth, and sustainability.

Focusing on cultural communities and young adults, the study explores patterns in sacramental participation, Mass attendance, and household membership, as well as the effects of parish decisions like closures and language-specific Masses.

Using statistical analysis and GIS mapping, it highlights how these groups experience parish life and offers insights to strengthen outreach, enhance cultural responsiveness, and guide data-driven resource allocation across Western Washington.

OBJECTIVES

- **Integrate data** from sacramental records, household demographics, Mass attendance, and financial reports across 136 parishes.
- **Analyze trends** in engagement among cultural communities and young adults, including impacts of closures and language-specific Masses.
- **Build models** to forecast parish vitality and evolving community needs using statistical methods and GIS mapping.
- **Deliver insights** through visualizations and a comprehensive report to guide long-term planning and outreach strategies.

SOLUTION APPROACH

DATA INTEGRATION



Parish Records

The Archdiocese of Seattle (2000–2024)



U.S. Census

demographic data

DATA PREPARATION

Cleaning, normalization, missing value imputation, SQLite database creation

MODELING



ARIMA

Forecasting parish population trends



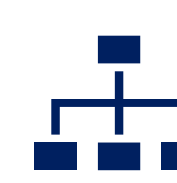
OLS & Lasso Regression

Key factors influencing young adult engagement



PCA + K-Means

Identify engagement patterns in parishes



T-Tests

Impact of structural changes and language Masses

DELIVERABLES



Model,
Graphs &
Maps



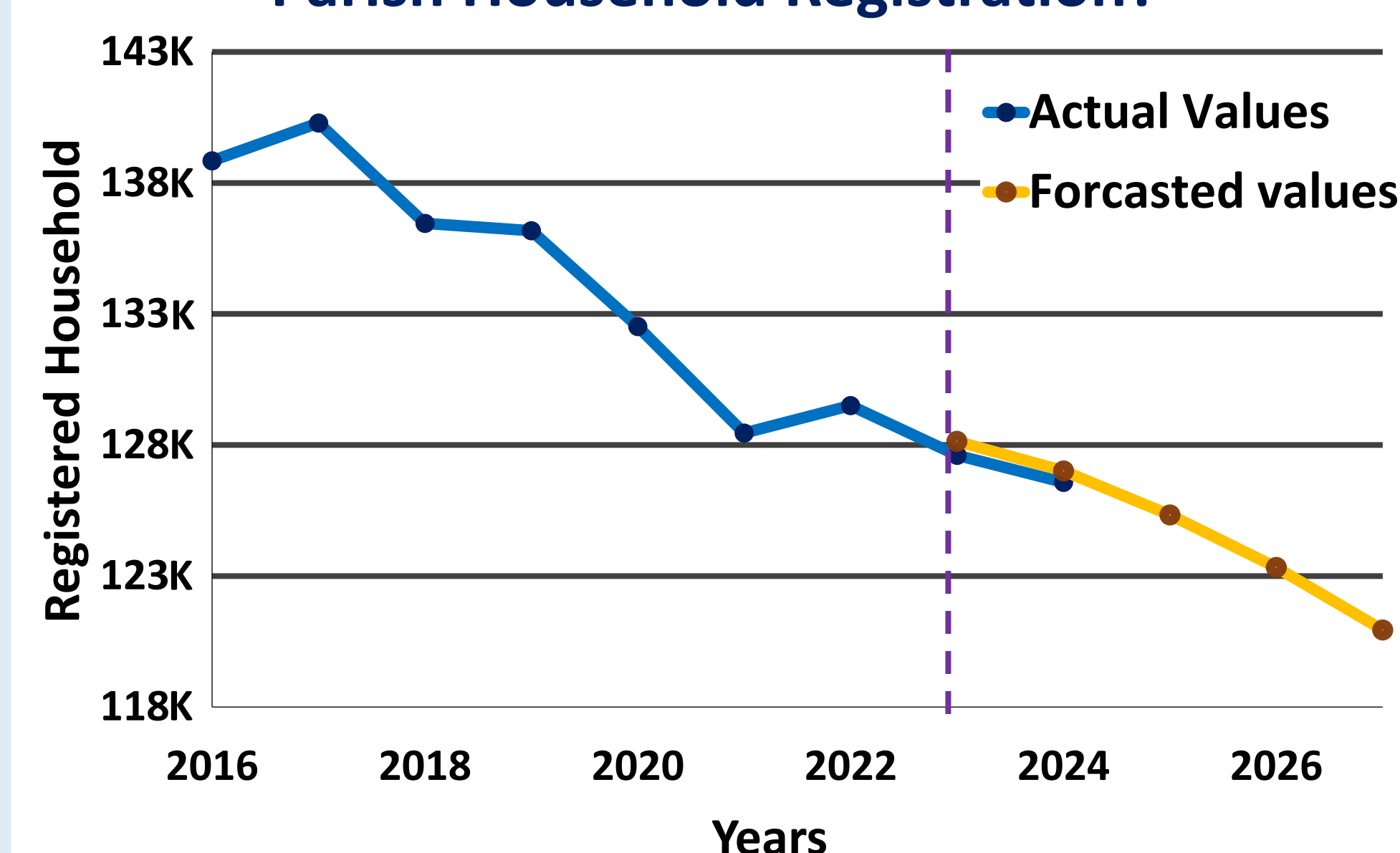
Report on the
outcomes



Actionable
Insights for
Leadership

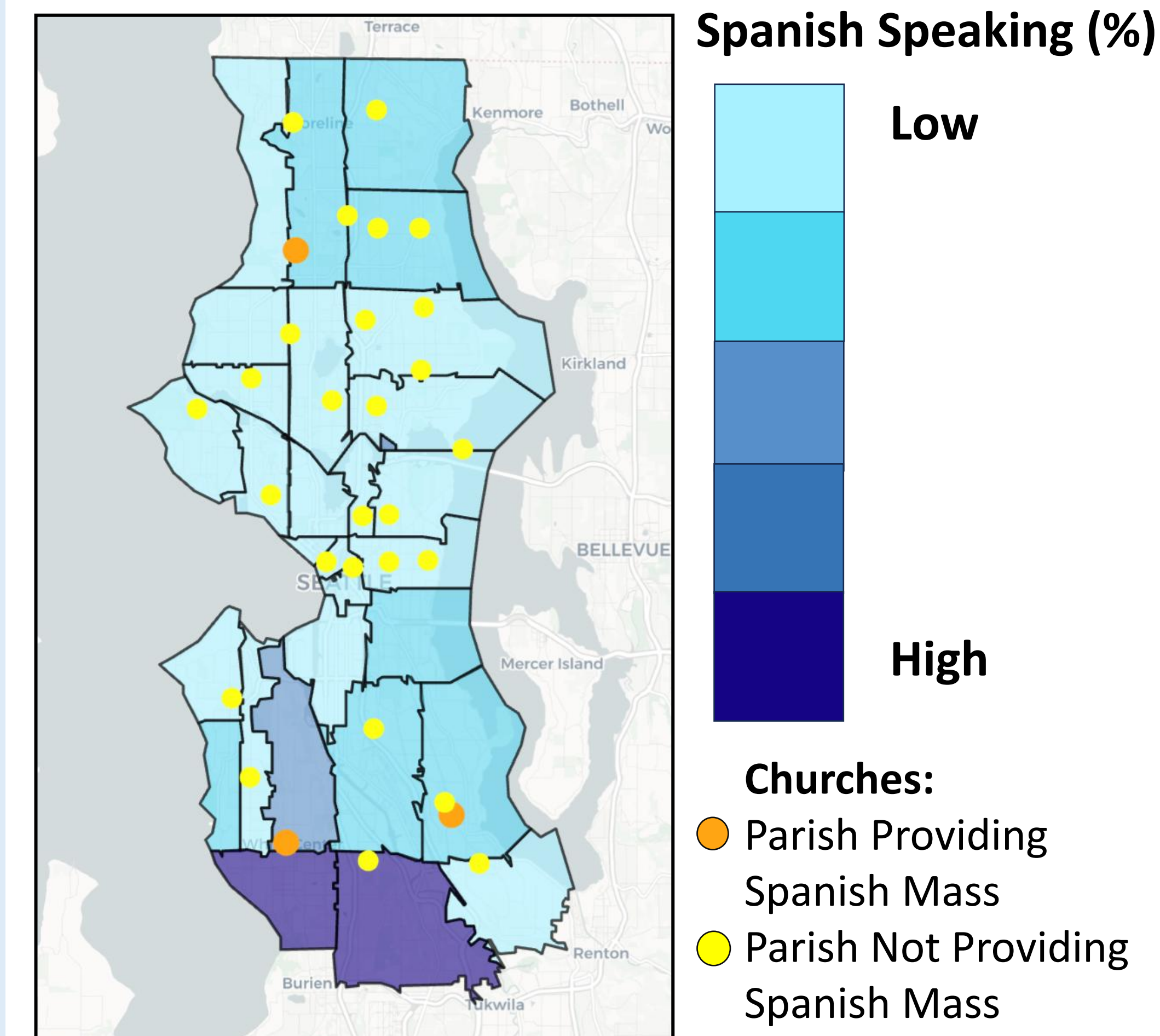
PREDICTION

What Are The Past And Projected Trends In Parish Household Registration?



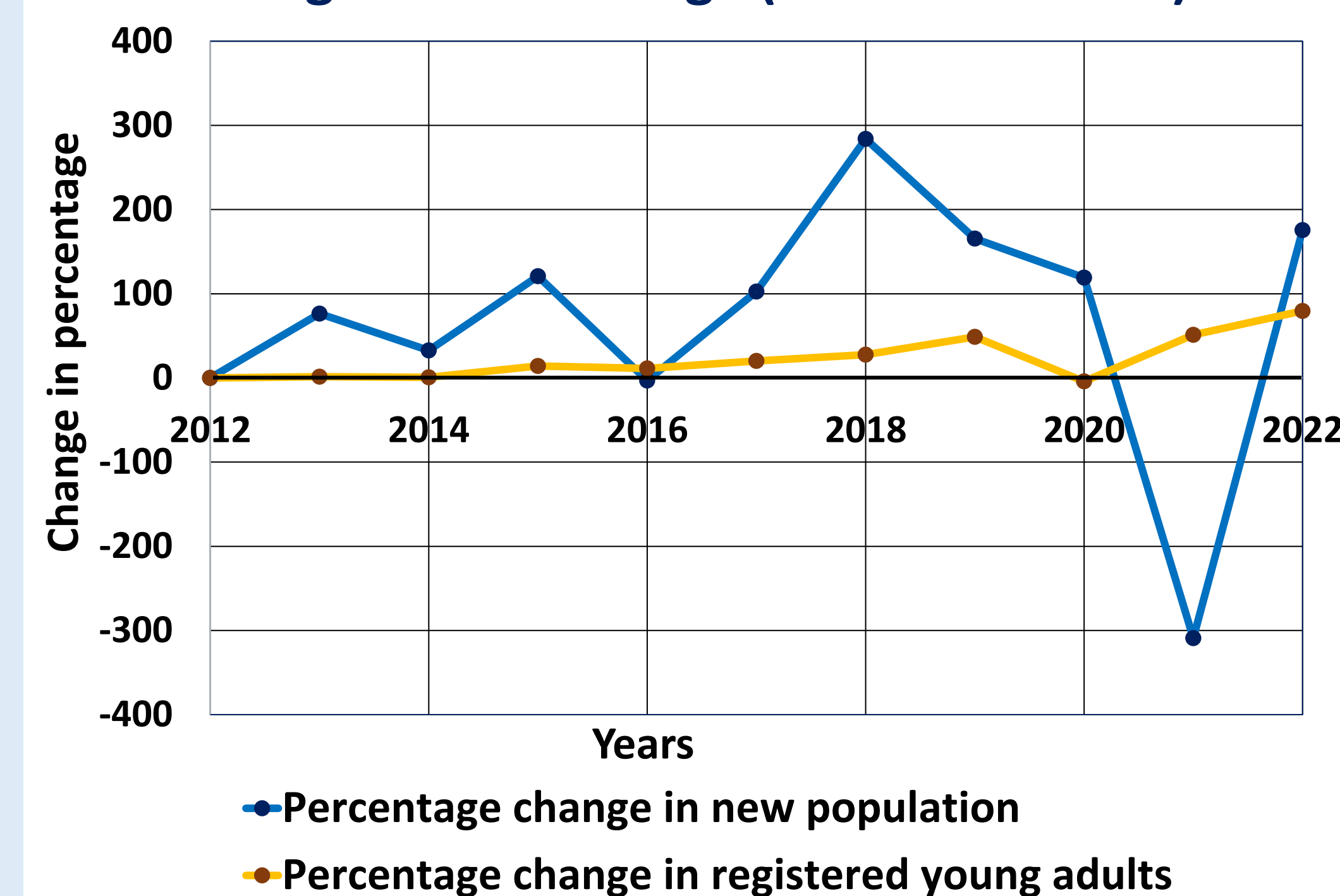
CULTURAL COMMUNITIES' ANALYSIS

Distribution of Spanish-Speaking Residents and Catholic Parishes in Seattle ZIP Codes



YOUNG ADULT ANALYSIS

Young Adult Population Change vs Registration Change (Base Year: 2012)



Which Factors Are Correlated With Young Adult Participation?

-0.106	Funerals	Correlation
-0.145	Polish language	
Hispanic Latino	0.164	
Revenue	0.374	
Baptisms	0.451	

KEY FINDINGS

YOUNG ADULT PARTICIPATION



Fluctuating Population, with 2 major spikes.



Engagement influenced by baptisms, average revenue by mass attendance & Hispanic/Latino presence

CULTURAL COMMUNITY GAPS



High Spanish-speaking population, no Spanish Masses - St. Mary - Centralia



Lower population, highest number of Spanish Masses - Sacred Heart - Tacoma

ARIMA FORECAST



A steady decline is predicted in Parish population approx. 1.44% for upcoming years based a decade data.



2023–2024 predictions closely match real data, validating model accuracy.



Signals a critical opportunity to act now and support parish vitality.

INSIGHTS

- Prioritize offering Spanish-language Masses in parishes with high Hispanic/Latino populations but currently limited or no such services.
- Plan young adult outreach campaigns proactively around periods of population spikes (e.g., as seen in 2018 and 2022).
- Develop tools to regularly update and track participation, Mass attendance, and demographic shifts for timely decision-making.
- Use trend forecasts to guide long-term pastoral planning and investment

THANK YOU



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