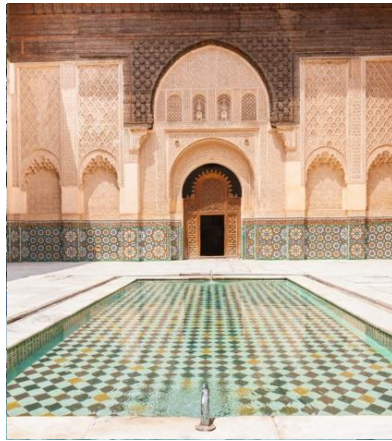


IHG[®]

HOTELS & RESORTS



Final Internship Presentation

Nathalie 'Nate' Jones

AUGUST 2023

Nathalie 'Nate' Jones

GIAD Intern, Advanced Analytics

Internship Manager: Adam Moseley

About Me

- Movies, games/puzzles, traveling
- Cat person

Graduated from Kennesaw State University (12/2021)

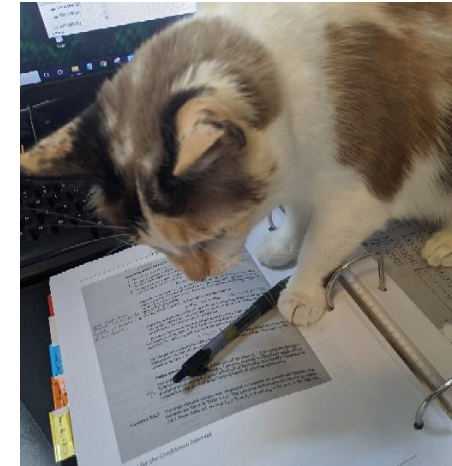
Bachelor of Science in Computational and Applied Mathematics

Minor in Applied Statistics and Data Analytics

Graduate Student at Kennesaw State University

Master of Science in Data Science and Analytics

- Estimated graduation 12/2023
- Presented 2 projects Southern Company (Fall 2022) and IHG Hotel & Resorts (Spring 2023)
- Presented 12 different projects at KSU's Analytics Day (2021, 2022), Harvard National Research Conference (2022), Posters on the Hill (2022), Posters at the GA Capitol (2022)
- Graduate Research Assistant in the CARES Lab (2022 –)



Learning Outcomes

ADVANCED ANALYTICS
2023 INTERNSHIP
PROJECT

- Synthesize Insights & Form Recommendations
- Strengthen Communication & Networking Skills
- Learn about IHG's Organizational Structure



Holiday Inn Resort & Suites – North Vancouver

Core Responsibilities

Key Projects

- Private Promotion Activation (PPA) Campaign Analysis
- Marketing Strategy Team Meeting
- Meet with IHG Colleagues across the Organization

Daily Tasks

- Pull Data from GCP (Data warehouse)
- Analyze and Visualize insights
- Attend meetings, Communicate via emails
- Collaborate with the Advanced Analytics team

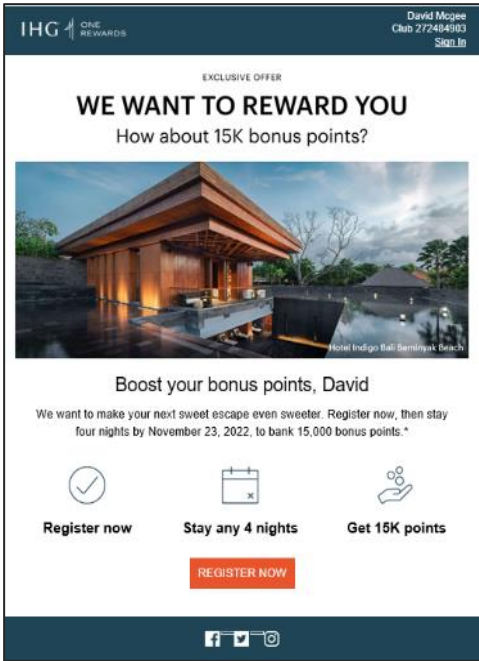
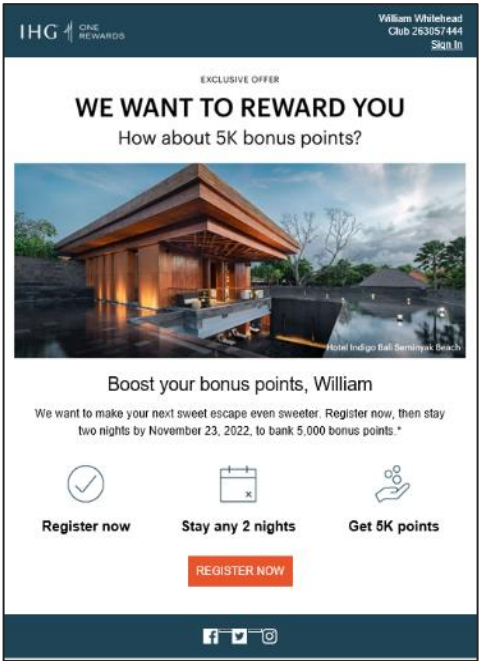
Private Promotion Activation Campaigns

Q4 2022 & Q2 2023 Promo-inactive (no participation in Multi-Brand promo in previous year) IHGOR members offered three private incentives

- Stay 2 nights, receive 5k points (5K2N)
- Stay 4 nights, receive 15k points (15K4N)
- Choice of one of the above (*not* Q2 2023)

Q2 2023 based on models from Q4 2022 campaign

- Member Tenure: (<12 months & 12+ months)
- P(Register): (Propensity to Register into Campaign)
- P(15K|Choice): (Selects 15K when offered choice)
- Optimal Offer: (Estimated incrementality)



Tenure	P(Register)	P(15K Choice)	Optimal Offer	Sizing / Distribution		
				5K	15K	Control
<12 months	High/Med	High	15K	20%	60%	20%
		Med	None	50%	0%	50%
		Low	5K	60%	20%	20%
	Low	High/Med/Low	5K	60%	20%	20%
12+ months	High	High	15K	20%	60%	20%
		Med/Low	None	50%	0%	50%
	Med/Low	High/Med/Low	None	50%	0%	50%

Private Promotion Activation Q2 | Summary Results

Promo-inactive Members were sent one of two promotions to try to reactive members into promotions

Segment	Tenure	P(REG)	P(15K Choice)	Optimal Offer	Registration Rate		(Mitigated) % Incremental RmNts	
					15K	5K	15K	5K
1	0-12M	High/Med	High	15K	1.3%	1.5%	1.10%	0.07%
2			Med	-		1.1%		1.56%
3			Low	5K	1.9%	2.9%	-3.79%	-0.11%
4		Low	High/Med/Low	5K	0.3%	0.4%	0.00%	0.35%
5	12M+	High	High	15K	2.9%	3.4%	0.00%	1.11%
6			Med/Low	-		3.5%		0.00%
7		Med/Low	High/Med/Low	-		0.6%		1.19%
Overall					1.07%	0.90%	\$ 23K	\$ 1.2M

While 15K offer has higher registration rate, each segment has 5K offer with higher registration rates

Negative Incrementality observed on several segments

- Results driven from small sample sizes, inequivalence, outlier high volumes
- Several mitigation methods resulted no substantial change
- Final incremental results based on mitigating algorithms

RECOMMENDATION & NEXT STEPS

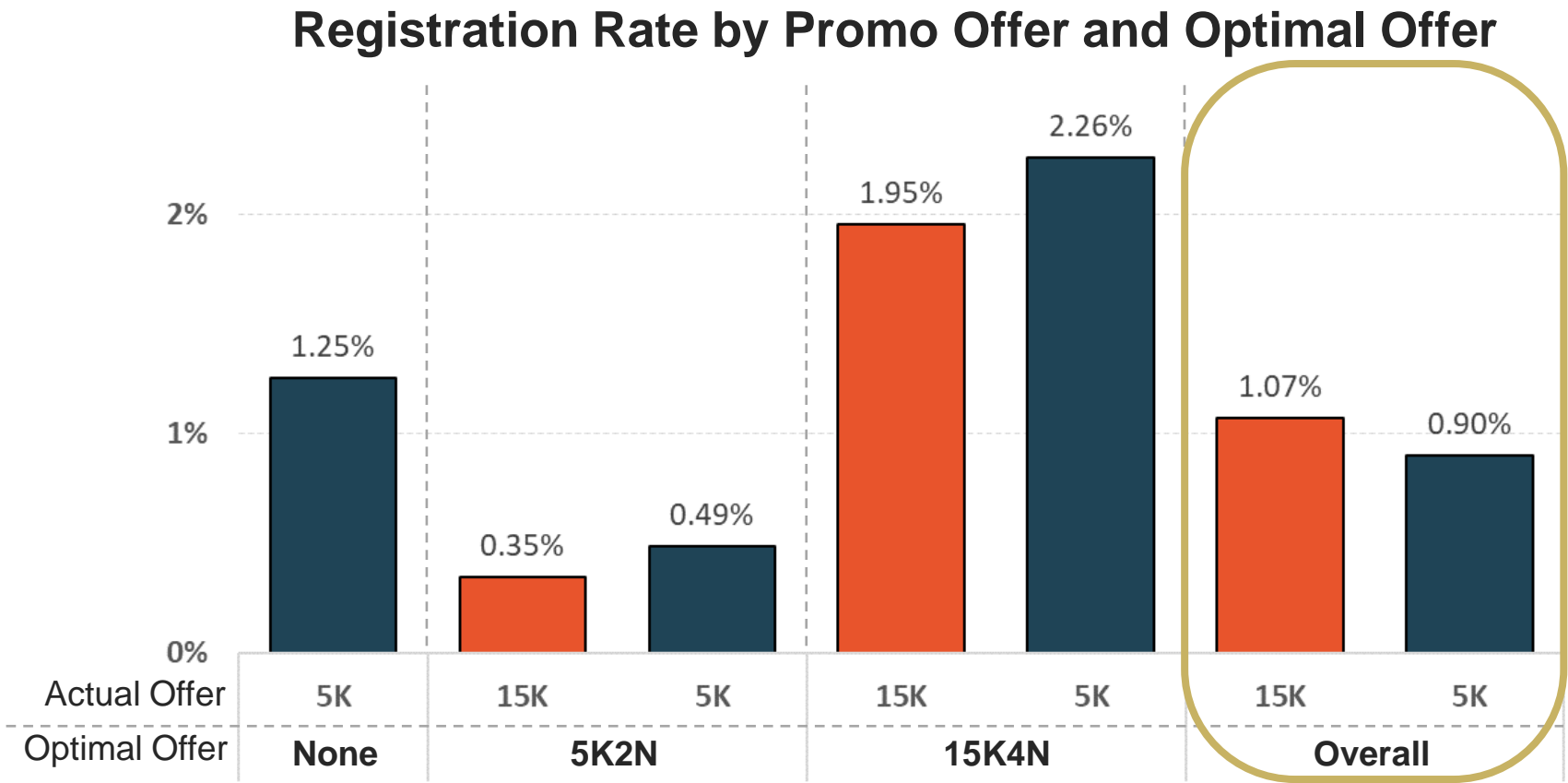
- Since new members do not have substantial history, exclude new members from future promo-inactive campaigns
- No longer provide 15K promotional offer for promo-inactive members

Campaign Registration Rate

0.94% registered overall

15K4N offer appears to have a higher registration rate

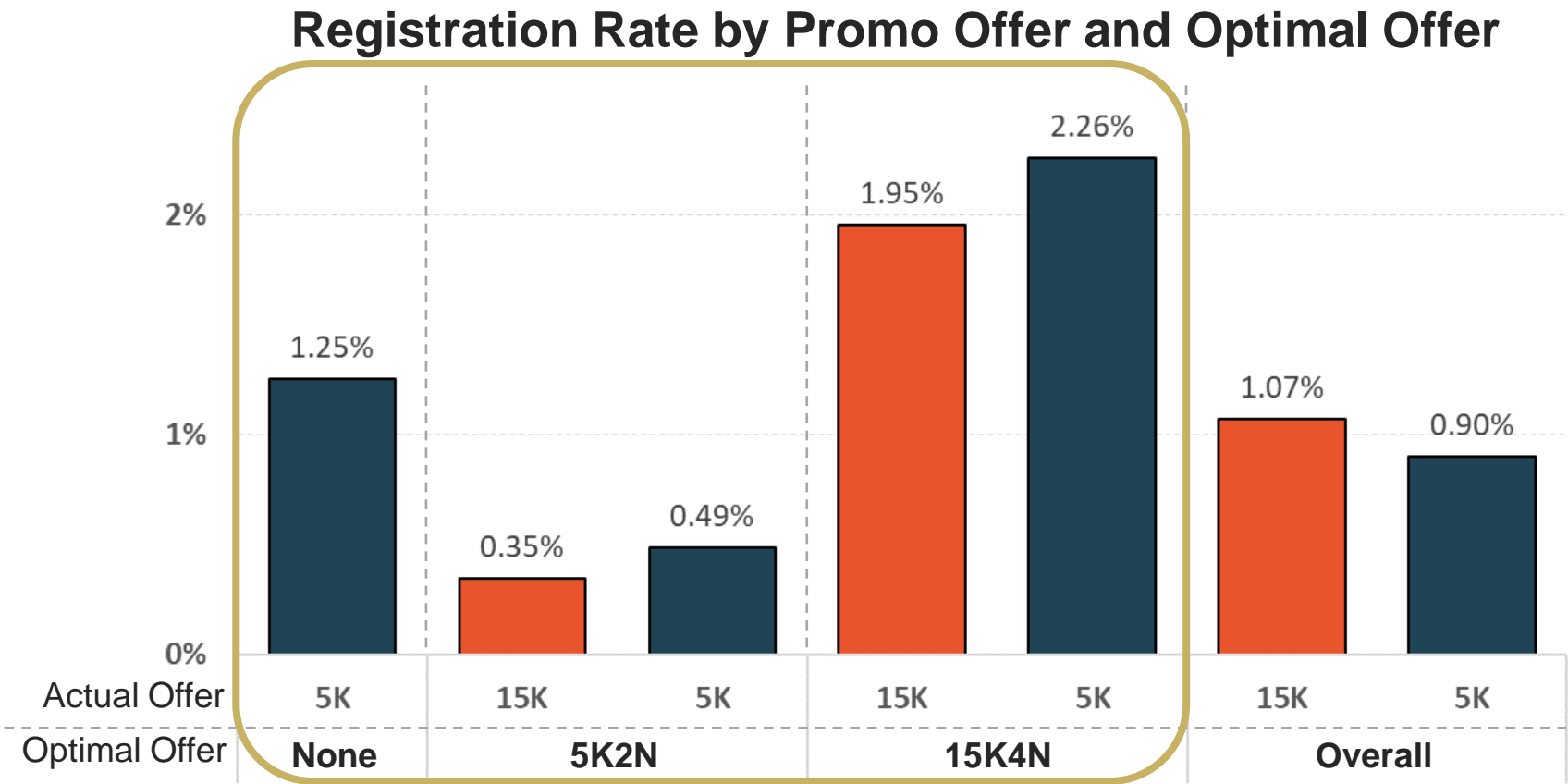
Further analysis and segmentation by Optimal Offer (determined from previous campaign results) and Sent Offer shows 5K2N offer outperforms 15K4N offer



Campaign Registration Rate



SIMPSON'S PARADOX!



Observations & Recommendations

OBSERVATION	RECOMMENDATIONS & NEXT STEPS
<ul style="list-style-type: none">• Imbalance between treatment group	<ul style="list-style-type: none">• Thorough QA checks before campaign launch
<ul style="list-style-type: none">• Registration model was accurate and strong predictor of promotional registration	<ul style="list-style-type: none">• Continue collaboration with Advanced Analytics to leverage statistical modeling for targeting
<ul style="list-style-type: none">• New members (0-12M) do not have as much time to have engaged a promotion	<ul style="list-style-type: none">• Exclude new members (0-12M) on future promo-inactive campaigns
<ul style="list-style-type: none">• Higher registration rates and incrementality for 5K2N offer compared against 15K4N offer• While total award costs not measured, 15K point award has higher cost than 5K point award	<ul style="list-style-type: none">• No longer provide 15K4N promotional offer for promo-inactive members

Changes in Perspective

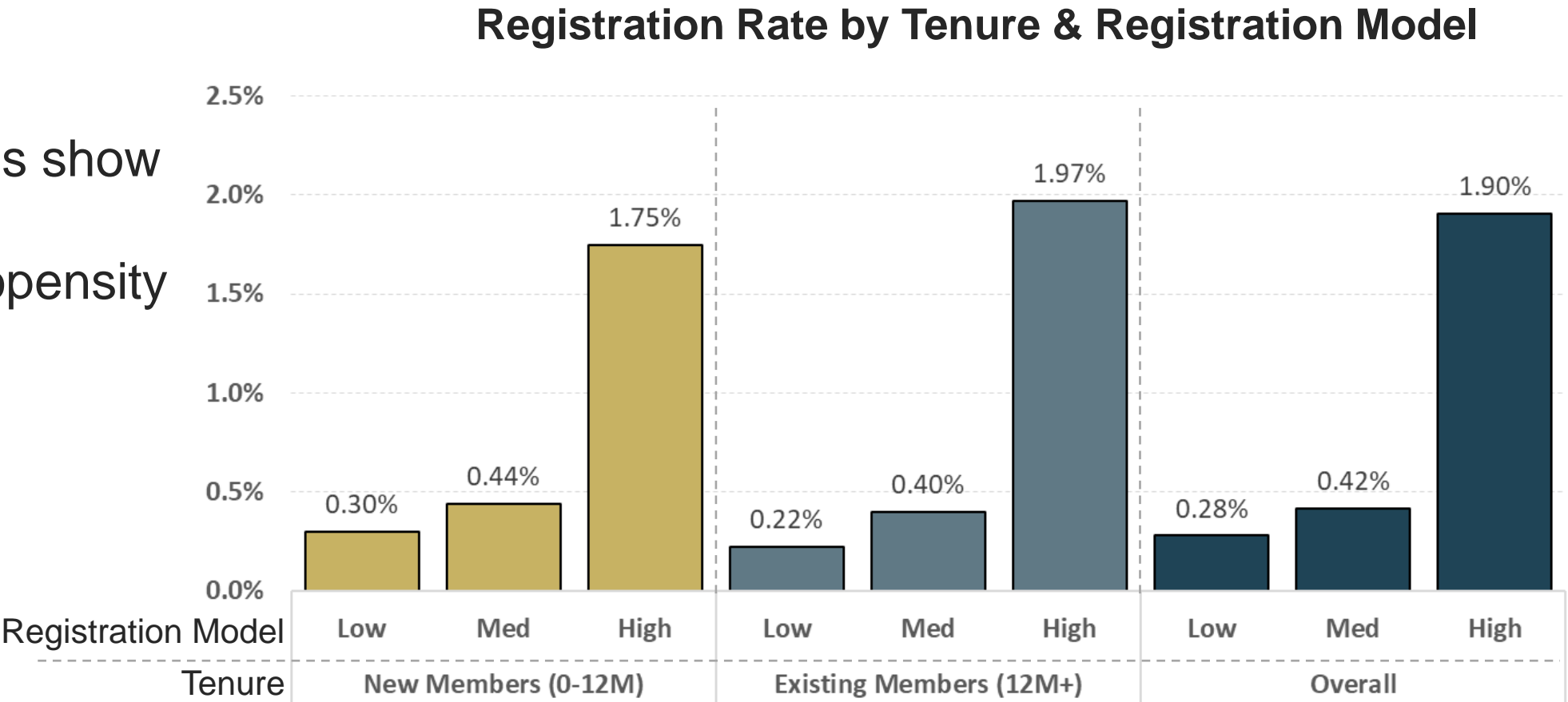
- Corporate environment, atmosphere, and structure
- Collaborating and networking across the organization
- IHG's perspective on growth, community, and learning
- The role of data analytics in the Hospitality Industry

THANK YOU!

Questions?

Registration Model Efficacy

Registration rates show
model built for
registration propensity
worked!



Campaign Bias Mitigation

Negative incrementality driven from

- Small sample sizes
- Inequivalence between treatment groups

Difference of Differences

- Compares promo period (45 days) to pre-promo period (45 days)
- Measures incremental RmNts within each time period
- Next, measures difference of incremental RmNts against each time period
- 15K4N offer incremental revenue accurately changed (\$650K → \$23K)

Segment	Tenure	P(REG)	P(15K Choice)	Optimal Offer	Members			(Pre-Campaign) % Incremental RmNts		(Actual-Campaign) % Incremental RmNts		(Mitigated) % Incremental RmNts		
					15K	5K	Control	15K	5K	15K	5K	15K	5K	
1	0-12M	High/Med	High	15K	372,461	124,168	124,434	0.80%	-0.68%	1.91%	-0.61%	1.10%	0.07%	
2			Med	-		288,324	288,322		-0.98%		0.58%		1.56%	
3			Low	5K	25,807	77,435	25,756	2.58%	0.68%	-1.20%	0.57%	-3.79%	-0.11%	
4		Low	High/Med/Low	5K	721,843	2,165,718	721,322	-0.82%	-0.59%	-0.84%	-0.24%	0.00%	0.35%	
5	12M+	High	High	15K	246,376	82,128	82,431	0.14%	2.42%	0.11%	3.53%	0.00%	1.11%	
6			Med/Low	-		385,660	385,592		0.68%		0.68%		0.00%	
7			Med/Low	High/Med/Low	-		1,167,185	1,167,348		-0.41%		0.77%		1.19%
Overall											\$ 650K	\$ 1.2M	\$ 23K	\$ 1.2M