

Wharton Analytics Fellows: Entercom

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Overview of Entercom / CBS Radio

- In 2017, Entercom and CBS Radio merged to become the second largest radio operator in the U.S. behind iHeart Radio
- We focused on mobile users of RADIO.COM app, which lets users to listen to over 300 stations and discover and enjoy music, news and sports radio across the U.S.





Our Mission:

Enable Entercom to understand user listening behavior to make more informed product and marketing decisions

Data we received:

1. Weekly listening data from 11/14 – 3/14, including: unique customer attribute, radio station listened, platform, Total Listening Hours (TLH), Session Starts (SS)

2. Radio station mapping table: genre and location of radio station

3. Marketing campaign data: name of each campaign, associated costs, users acquired

Project Workstreams

Mission: Enable Entercom to understand user listening behavior to make more informed product and marketing decisions

WORKSTREAM 1: PRODUCT ANALYTICS



- **Develop:** Deliver key product metrics
 - How long are users listening
 - How often are users listening
 - What is their average time spent listening
- **Explore:** Analyze buckets of loyalty and patterns by genre
- **Synthesize:** Insights to drive decisions to maximize retention, loyalty, CLTV

WORKSTREAM 2: MARKETING ANALYTICS



- **Measure:** Determine users acquired by campaign
 - Revenue acquired by each campaign
 - Campaign acquired most valuable users
 - Number of users
- **Evaluate:** Calculate ROI of paid campaigns to inform future marketing spend decisions

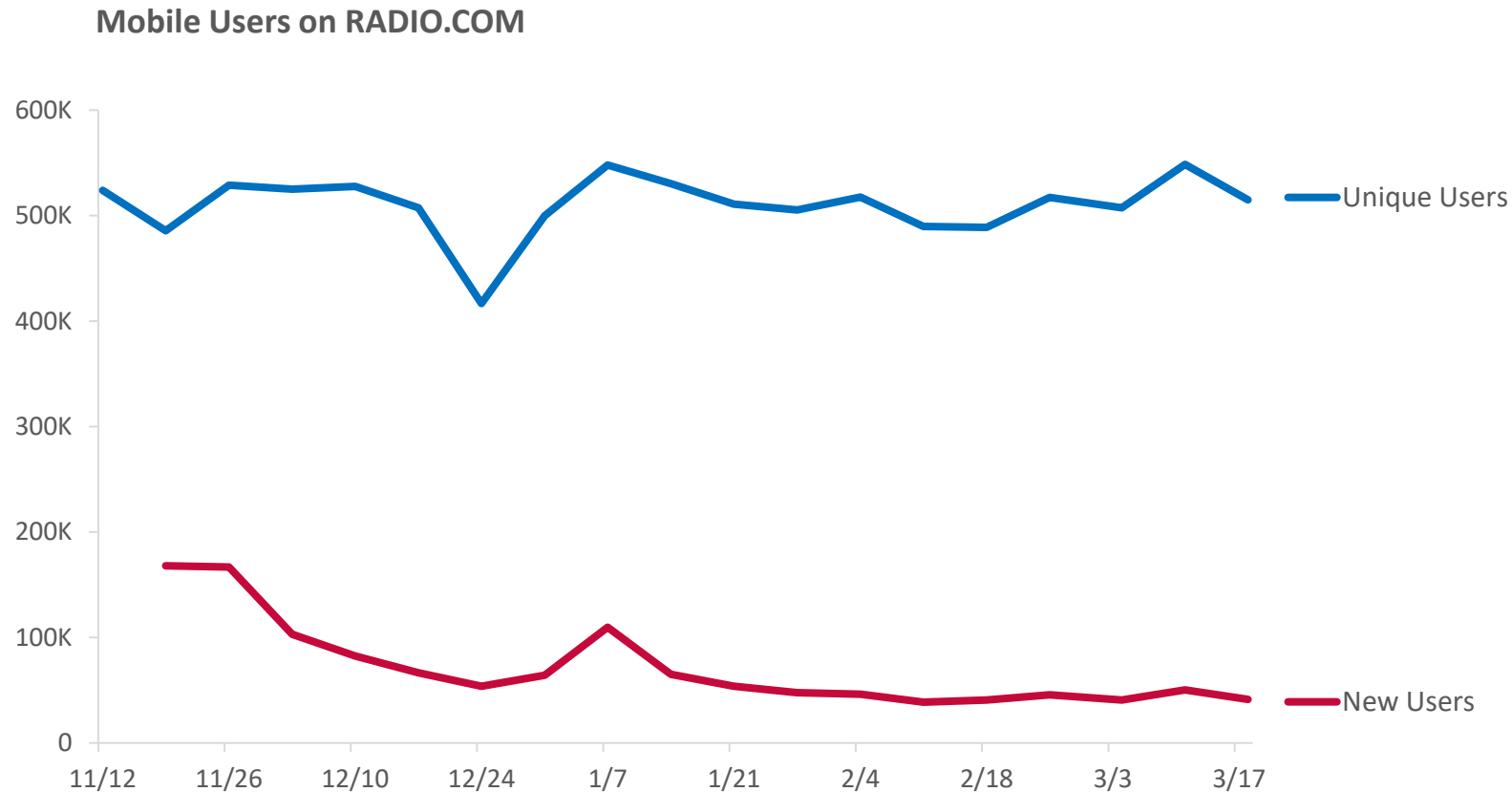
Product Analytics

**We analyzed RADIO.COM
Listeners over a 5 month
period**

Get to know your users

- 🔍 **What is user growth? What are their listening habits? Are there distinct clusters?**
- 🔍 **How does listening behavior vary by genre?**
- 🔍 **Do users listen to just one station regularly or multiple stations?**
- 🔍 **What is the churn rate?**

Unique users has stagnated and new users growth slowing



RADIO.COM – Describing your mobile app audience



4.3 hrs

Average total listening hours



10.6

Average session starts



510K

Average weekly unique users



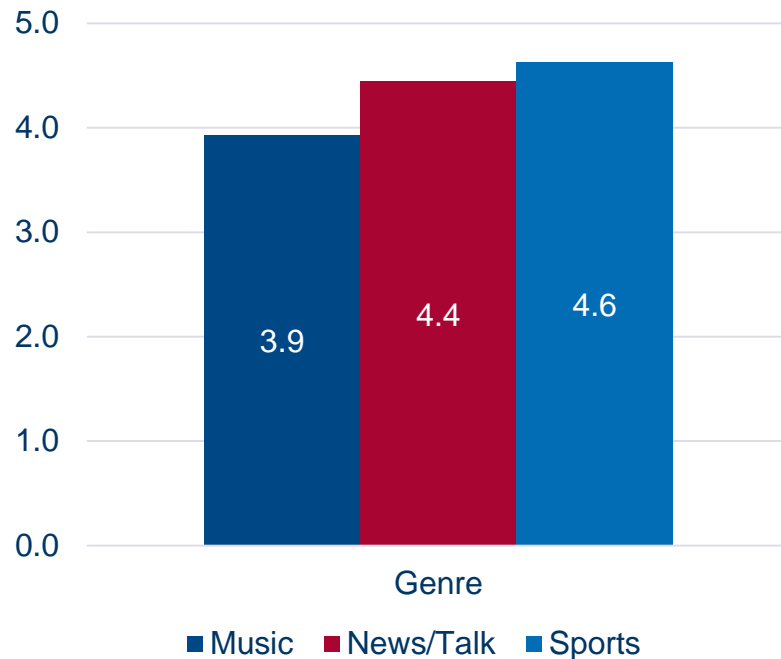
28 min

Average time spent listening

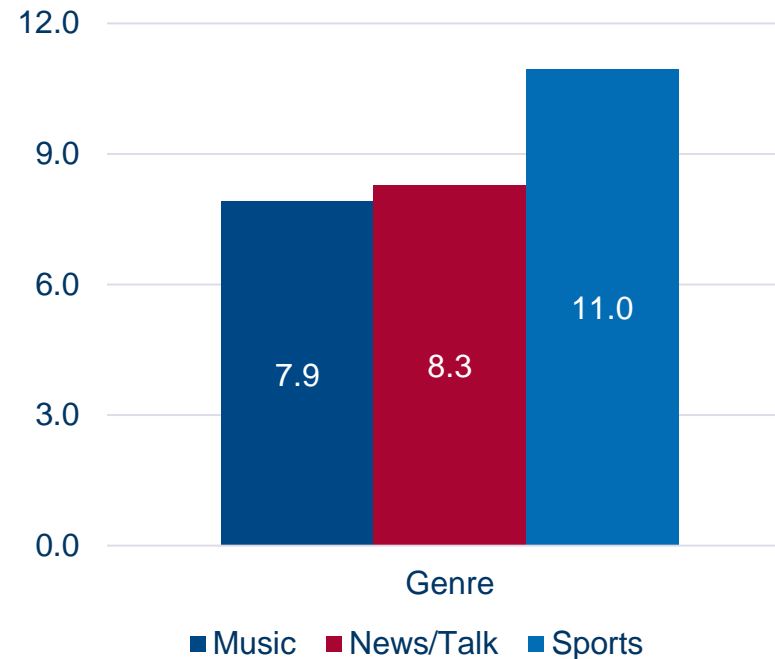


Sports listeners have higher TLH and SS but lower ATSL

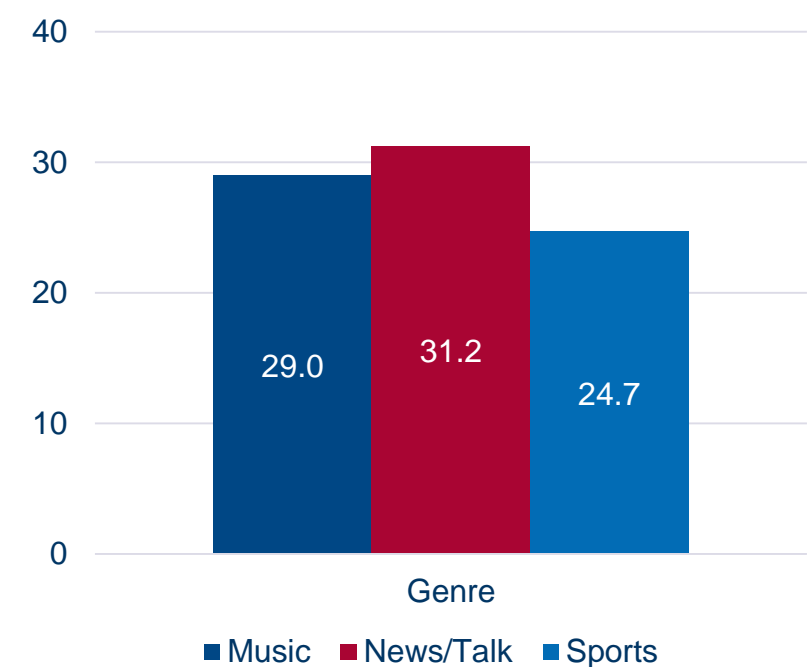
Average TLH per user by genre



Average SS per user by genre

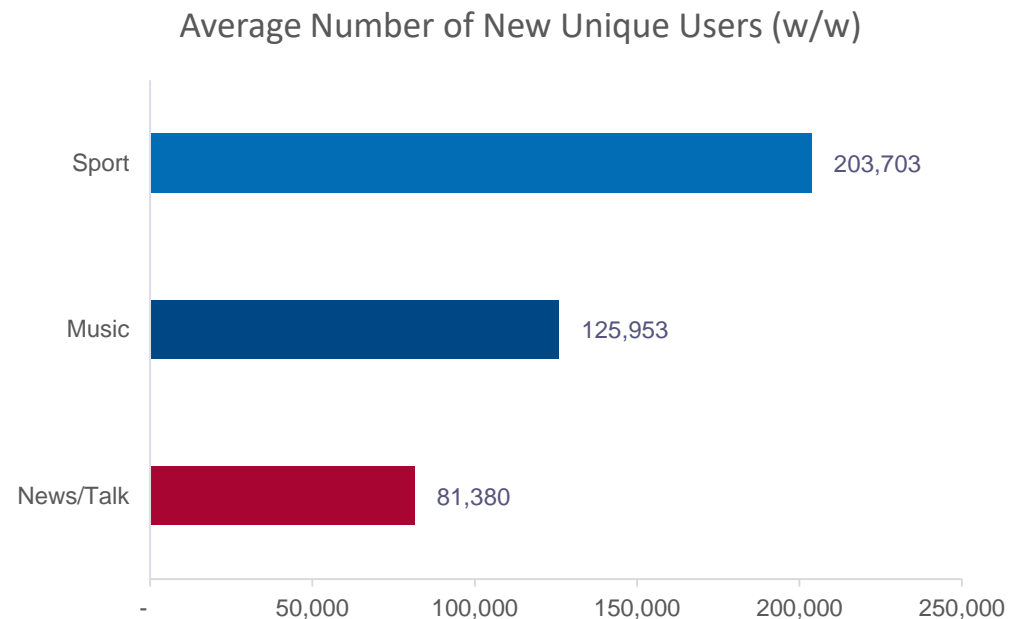
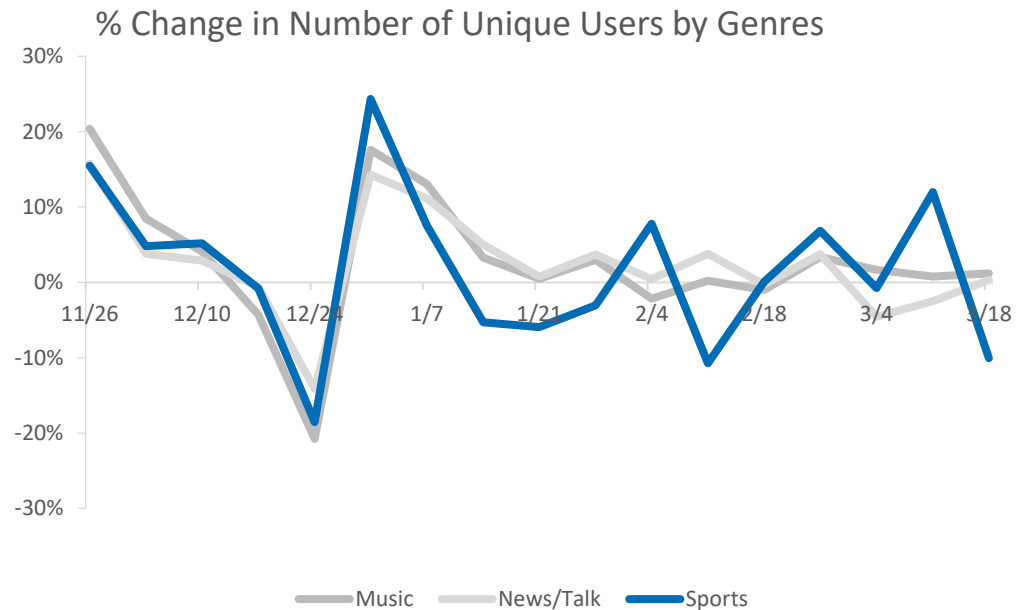


Average time spent listening (minutes) by genre



Describing the audience by Genres

Number of new sport listeners fluctuates more than the other genres on a week by week basis



Assessing user loyalty clusters

68% users are light users, so opportunity to increase engagement

USER LOYALTY CLUSTERS



Light

68.1% User with average weekly TLH < 2 hr

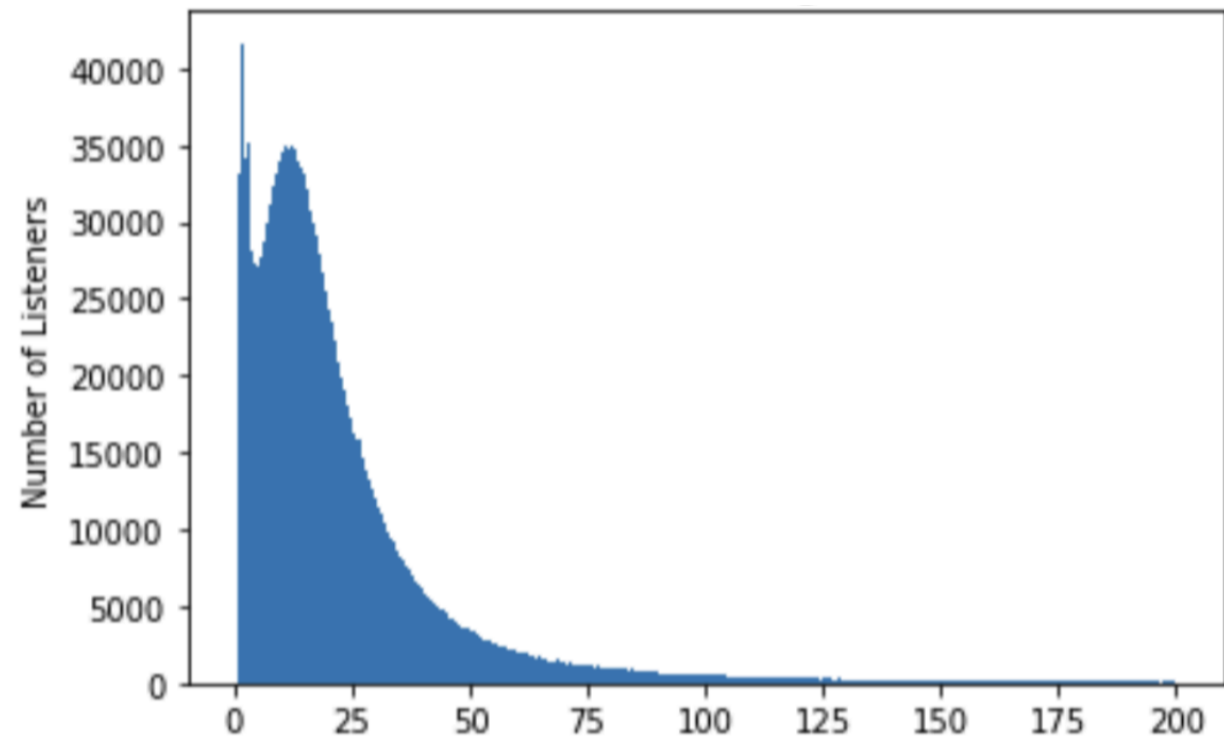
Medium

21.8% User with average weekly TLH ≥ 2 hr and ≤ 6 hours

Heavy

10.6% User with average weekly TLH of 6+

DISTRIBUTION OF AVERAGE WEEKLY TLH



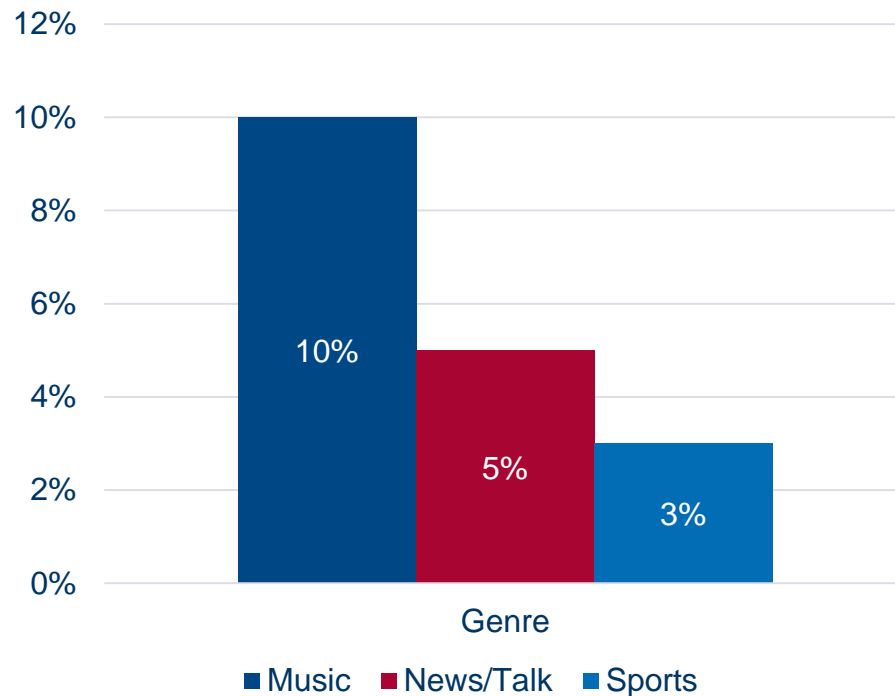
Users tend to listen to just one station,
particularly for sports



12.2 %

Users listening to more than one
distinct stations per week

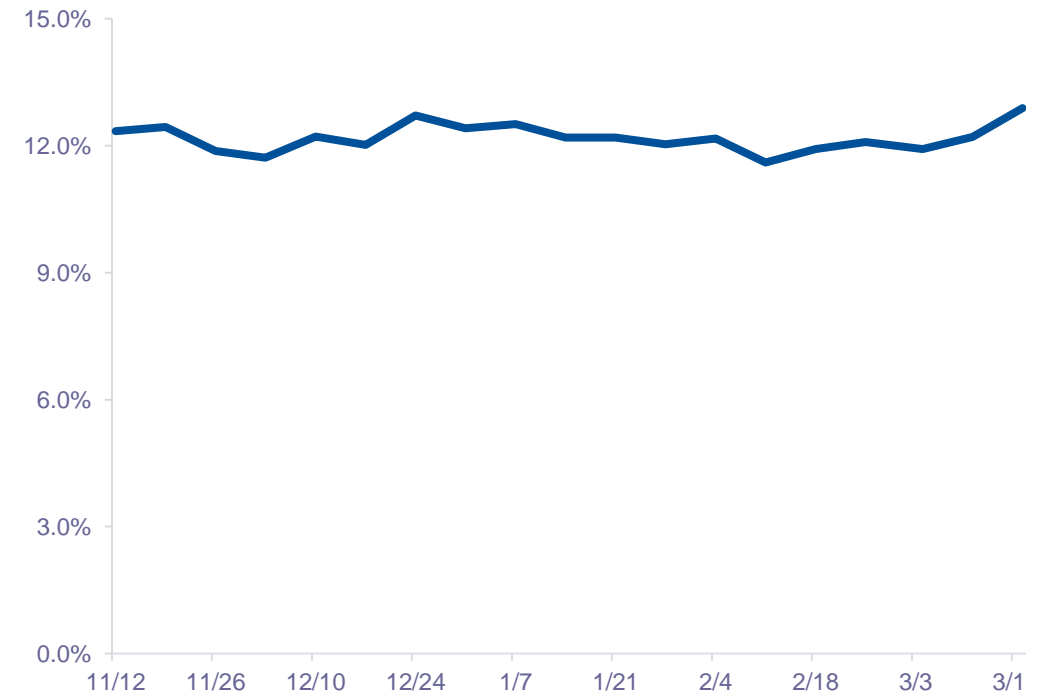
Percentage of users listening to more than one
station per week: GENRE



Multi-station listenership is low and generally stable

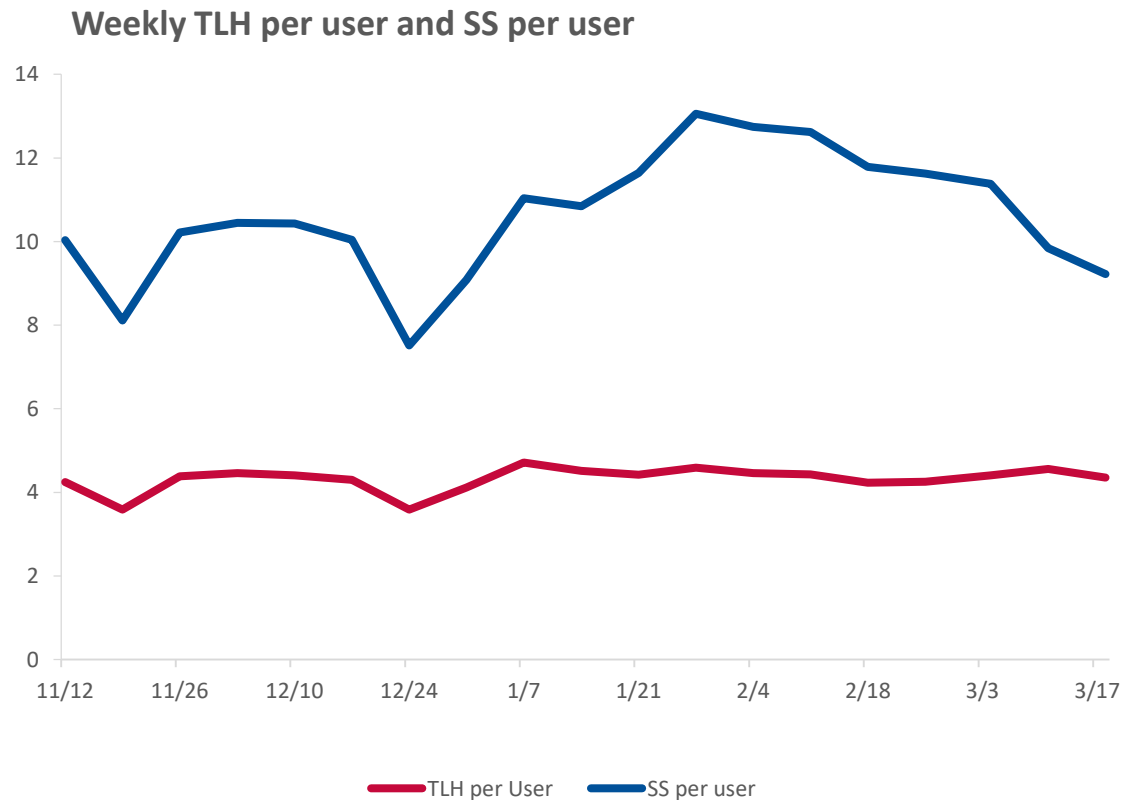
- Opportunity to increase user interest in multiple stations

Percentage of users who listen to more than one
distinct station: TIME SERIES



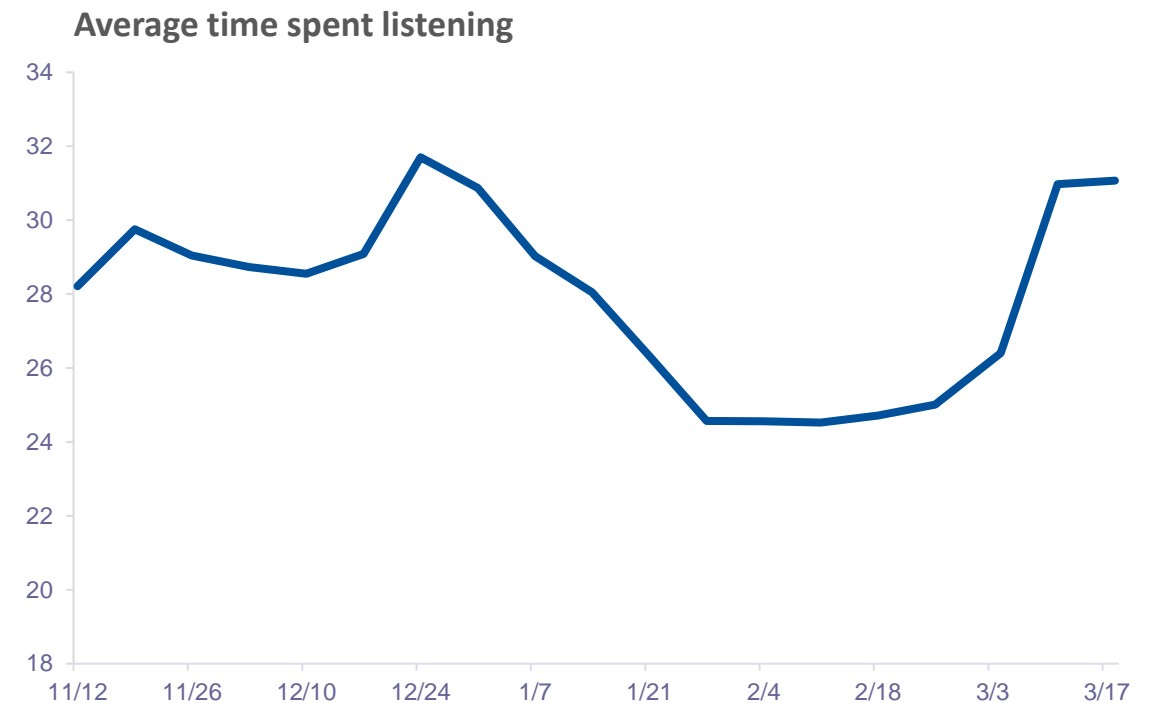
SS per user peaked in Feb and TLH per user remains consistent

- Session Starts increase between holiday session and start of Feb



ATSL has fluctuated significantly over last 3 months

- ATSL peaked at 32 min the week of 12/24 and dropped to 25 min the week of 1/28.
- The week of 3/1, there was a 18 w/w increase and ATSL was back to 31 min



Marketing Analytics

App Store related downloads have higher CLV

Summary of Results for Paid Campaigns - Ordered by Vendor (Apple vs. Google)

Attribution Campaign Name	Campaign Launch			Total				Avg per User per Week						ROI per User based on TLH			Annualized Total ROI		
	Start	End	Vendor	TLH	SS	Users Acq.	Cost (\$)	TLH (hrs)	SS	ATSL (min)	Users	Users (% of Total)	Cost (\$)	Rev per User (\$)	Cost per User (\$)	ROI per User	Total Rev (\$)	Total Cost (\$)	Total ROI
Radio.com Branded 8.6.18	8.6.19	To Date	Apple	219,219	479,951	7,846	19,313	3.29	7.17	27.51	3,517	44.8%	1,016	0.36	0.29	24.5%	35,166	19,313	82.1%
Radio.com Non Branded 8.6.18	8.6.19	To Date	Apple	100,690	243,428	5,015	39,801	2.77	6.67	24.87	1,927	38.4%	2,095	0.30	1.09	(72.2%)	19,272	39,801	(51.6%)
Radio.com Competitive 8.6.18	8.6.19	To Date	Apple	27,168	66,579	1,445	35,420	2.22	5.42	24.57	652	45.1%	1,864	0.24	2.86	(91.5%)	6,517	35,420	(81.6%)
Total				347,078	789,958	14,306	94,535	3.00	6.82	26.36	6,095	42.6%	4,976	0.33	0.82	(59.8%)	60,955	94,535	(35.5%)
App Install IOS Urban	7.23.18	To Date	Google	35,380	77,219	1,967	7,240	2.91	6.33	27.61	641	32.6%	381	0.32	0.59	(46.4%)	6,408	7,240	(11.5%)
App Install IOS Rural	7.23.18	To Date	Google	3,465	8,831	303	1,824	2.48	6.29	23.61	75	24.8%	96	0.27	1.28	(78.8%)	750	1,824	(58.9%)
App Install Android Urban	7.23.18	To Date	Google	133,025	389,325	6,866	22,060	3.79	11.21	20.29	1,871	27.2%	1,161	0.42	0.62	(33.1%)	18,707	22,060	(15.2%)
App Install Android Rural	7.23.18	To Date	Google	52,972	165,884	2,391	6,844	3.77	11.86	19.09	746	31.2%	360	0.41	0.48	(14.4%)	7,462	6,844	9.0%
Total				224,840	641,259	11,527	37,968	3.55	10.13	21.04	3,333	28.9%	1,998	0.39	0.60	(35.2%)	33,327	37,968	(12.2%)

TAKEAWAYS

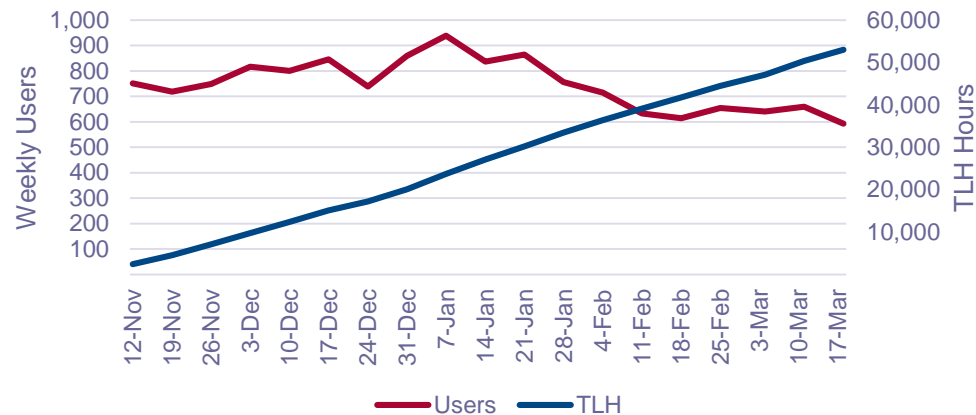


- While iTunes App Store related campaigns have a lower short term ROI, they generate a sticker consumer as defined by total active users being 43% compared to 29% for Google platform related campaigns, not too mention total users acquired also remains about 3,000 listeners higher
- Short-term ROI is skewed positive for Radio.com branded searches as compared to Non-Branded or Competitive searches, however ATSL and % of Users listening remains consistent across marketing campaigns
- ATSL is on average about 5 minutes higher for those users acquired via the iTunes App store vs. Google platforms
- A convergence of Google platform advertising to that of iTunes App Store could lead to a \$12k increase per campaign in revenue assuming no increased customer acquisition and a \$20k increase per campaign in revenue assuming customer acquisition

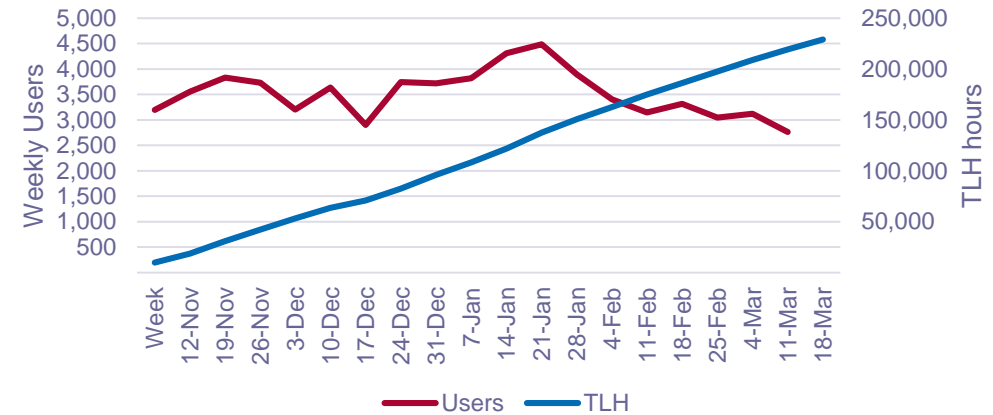
TLH and Users by campaign

While short term ROI is negative, trends are showing that *App Install Android Rural* and *Radio.com Branded 8.6.18* campaigns are continuing to grow and should become profitable while *Radio.com Pandora* and *Radio.com competitive 8.6.18* campaigns have plateaued

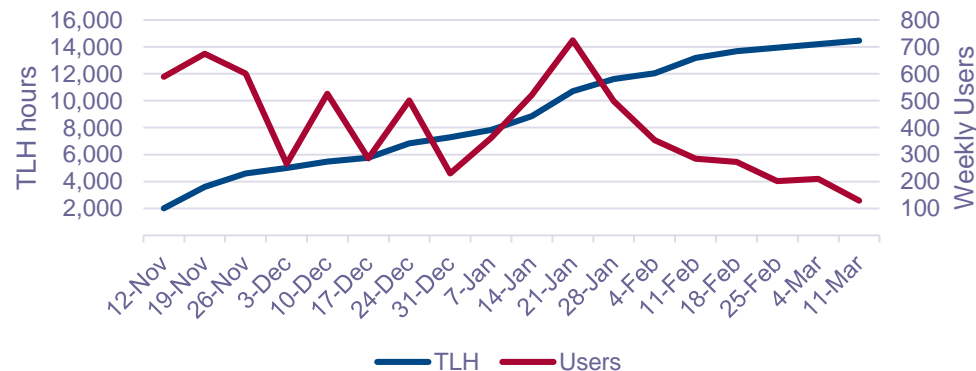
App Install Android Rural ~ **9.0%**



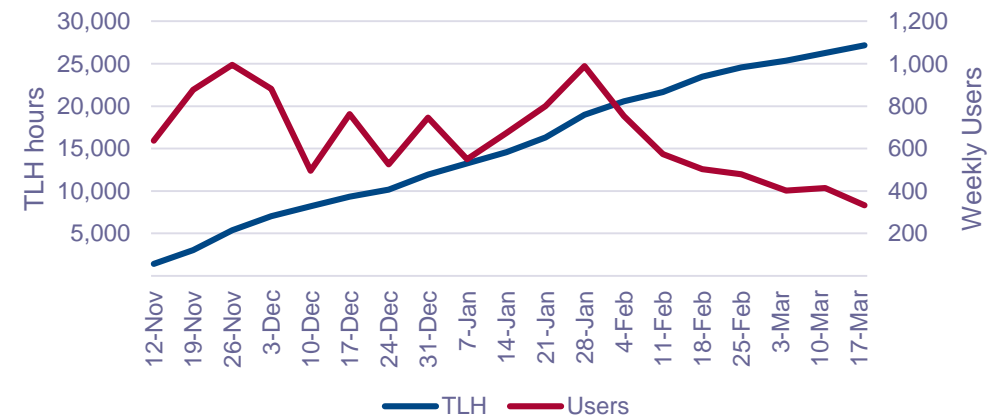
Radio.com Branded 8.6.18 ~ **82.1%**



Radio.com PANDORA Lock Box 9.19.18
~ **-78.7%**

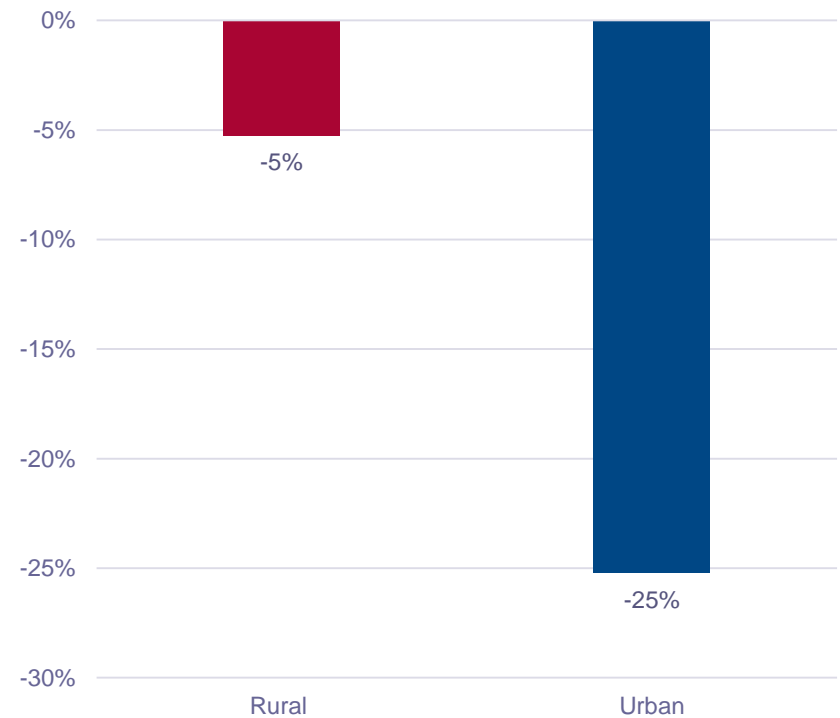


Radio.com Competitive 8.6.18 ~ **-81.6%**

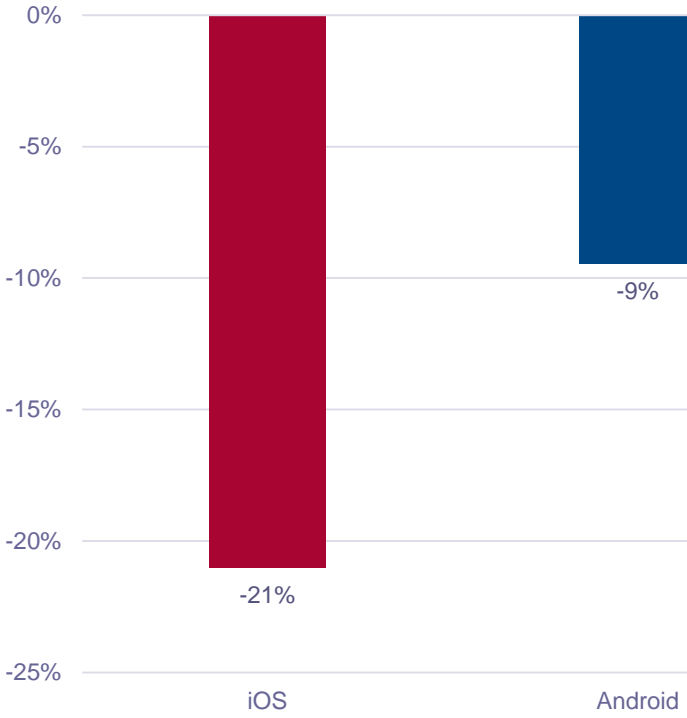


Comparison between platforms and locations

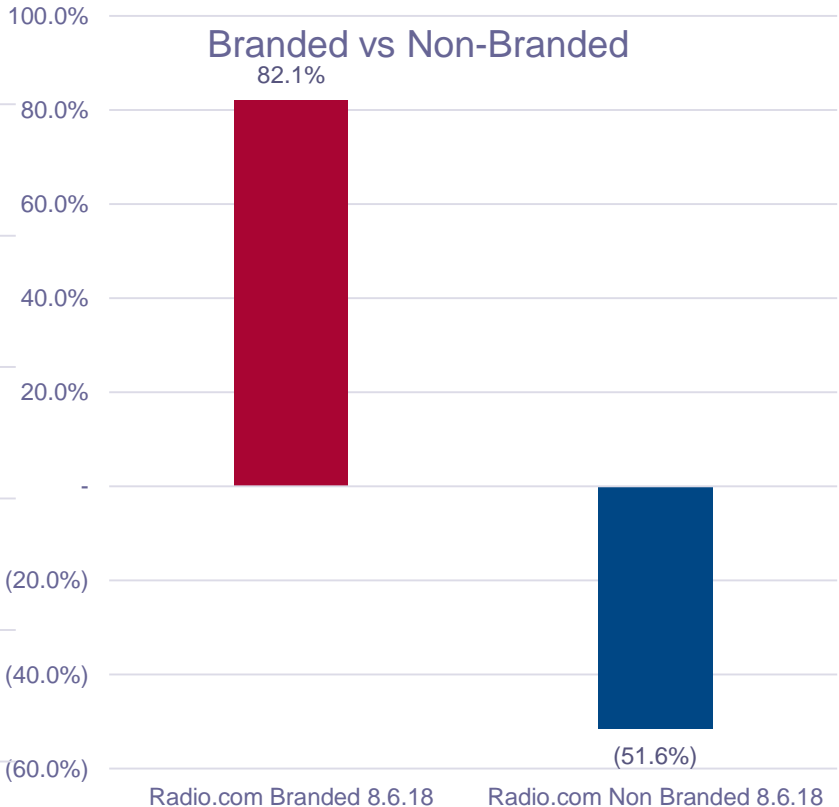
Rural vs Urban



iOS vs Android

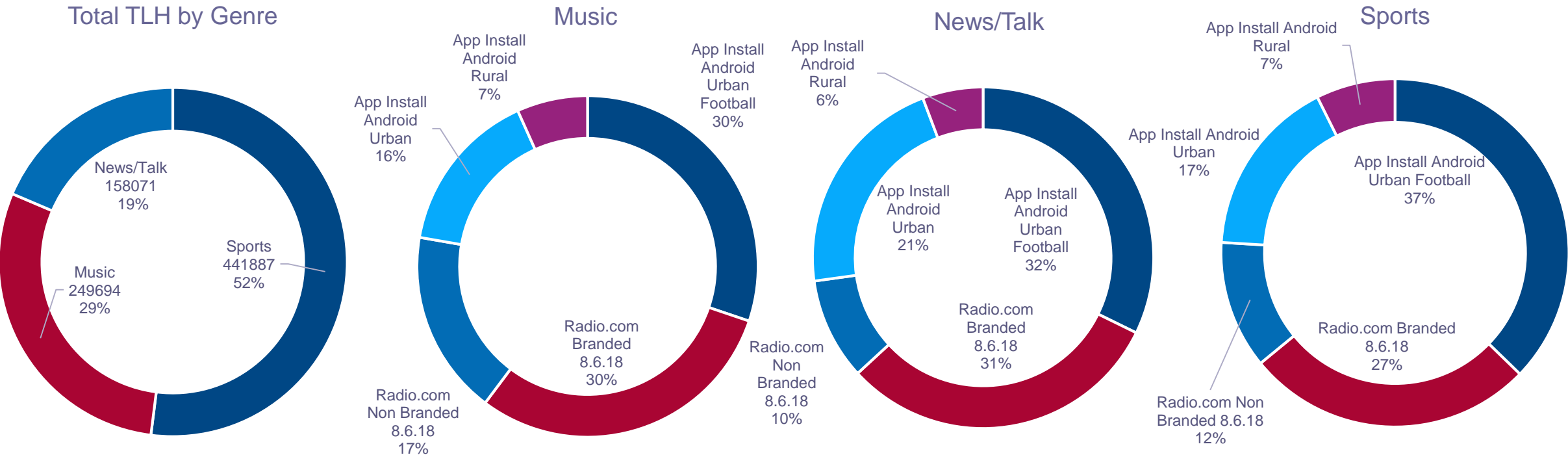


Branded vs Non-Branded



Campaign Analysis by Genre

The majority of TLH originates from Sports stations, with TLH generated from campaign staying relatively similar across genres



Lessons Learned and Recommendations

#1: Improve data infrastructure now to avoid accumulation of technical debt and improve speed of decisions



Invest in and set up SQL to increase speed of analytics work and decision-making. We faced many challenges & limitations processing large txt datafiles in python (e.g. too computationally expensive to calculate churn). Current FTP vendor model won't scale with growth

#2 Sports listeners are stickiest user group. Recommend to increase marketing and product features for sports

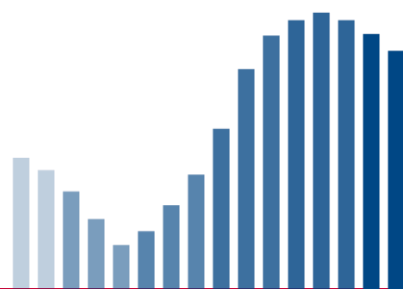


Sports listeners had the highest TLH / SS for Entercom. Sports radio has fewer substitutes. Review customer demographics / surveys to validate findings to motivate a more effective marketing recommendation.

#3 Invest in marketing campaigns that maximize TLH / SS



Recommend tracking campaigns that maximized TLH / SS. Learn more about each paid campaign to understand cause of higher TLH / SS. Determine whether this led to higher Revenue and CLV by more effectively measuring customer loyalty



Wharton Analytics Fellows

Thank you!

Questions?