
Arrow Platform

Fair Share and Penetration Calculations



Residential opportunity fair share is estimated by combining the Competition Manager inputs and the competitive intelligence data available for each location



List all providers serving the census block in which the location is situated using FCC's BDC fabric data (for US-based implementations)

Look up reported maximum download speed for each provider and technology (for a given census block)

Convert download speeds to Speed Strength values (0-1 scale)

Multiply each provider's strength score by 'Brand Strength' to arrive at final competitive strength for a provider (e.g., superior brand recognition in consumers' minds results in more competitive offer even when speeds and technologies may be the same)

Sum up competitive strengths of all providers in a given census block, add expected offer strength from Arrow's plan, to determine resulting fair share

Lookup from Competition Resource Manager. Set 1 one by default for all providers and self.
When running overbuild plans from a provider perspective, ensure that own strength is set to zero to avoid treating legacy assets as a competitor.

Calculated by Altman Solon based on the available FCC data

Lookup from Speed Matrix section of Competition Resource Manager (using technology and maximum download speed)

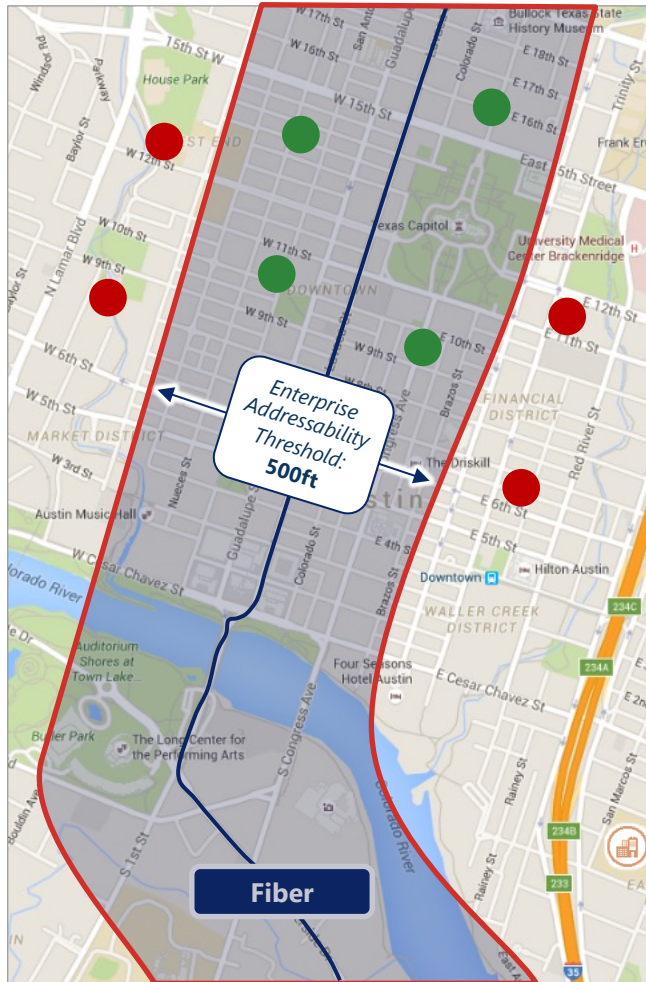
Provider total strength / Sum of all provider's total strength

ILLUSTRATIVE

Provider	Technology	Max Download Speed (Mbps)	Area Coverage	x	Technology Strength	x	Brand Strength	=	Total Strength	>	Implied Fair Share
Provider A	Copper	25	25%		0.25		1.00		0.0625		2.56%
Provider A	Fiber	150	75%		1.00		1.00	x	0.75		30.77%
Provider B	Fiber	500	50%		1.00		0.75		0.375		15.38%
Provider C	Satellite	30	100%		0.00		1.00		0.00		0.00%
Provider D	Fixed Wireless	125	100%		0.25		1.00		0.25		10.26%
Arrow Planned Network	Fiber	1,000	100%		1.00		1.00		1.00		41.03%

Tip: Target Fair Share can be directly specified for each location by supplying "ROIC.BAU.FAIR_SHARE" and "ROIC.PLAN.FAIR_SHARE" parameters during location upload

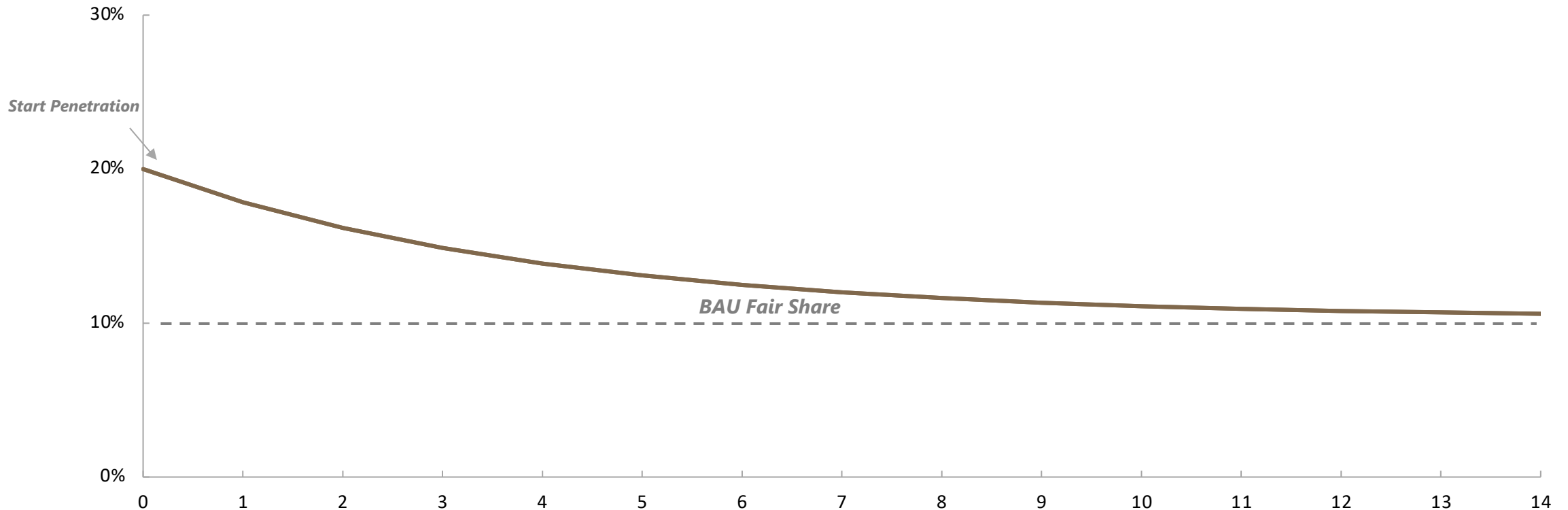
Tower and Business opportunity fair share is estimated for each location by determining the number of competitors within a specified distance



1. Put a buffer of around all the competitive fiber routes from the Geotel dataset (buffer radius adjustable in Planning Constraints Manager)
2. For each location, calculate how many competitive fiber route buffers it is contained within, and their respective brand strengths
3. Fair share is calculated as:
 $1 / (1 + (\text{number of competitors} * \text{respective brand strength}))$

Tip: Target Fair Share can be directly specified for each location by supplying "ROIC.BAU.FAIR_SHARE" and "ROIC.PLAN.FAIR_SHARE" parameters during location upload

BAU penetration curves are based on decay towards estimated BAU fair share penetration, with rate of change determining decay rate

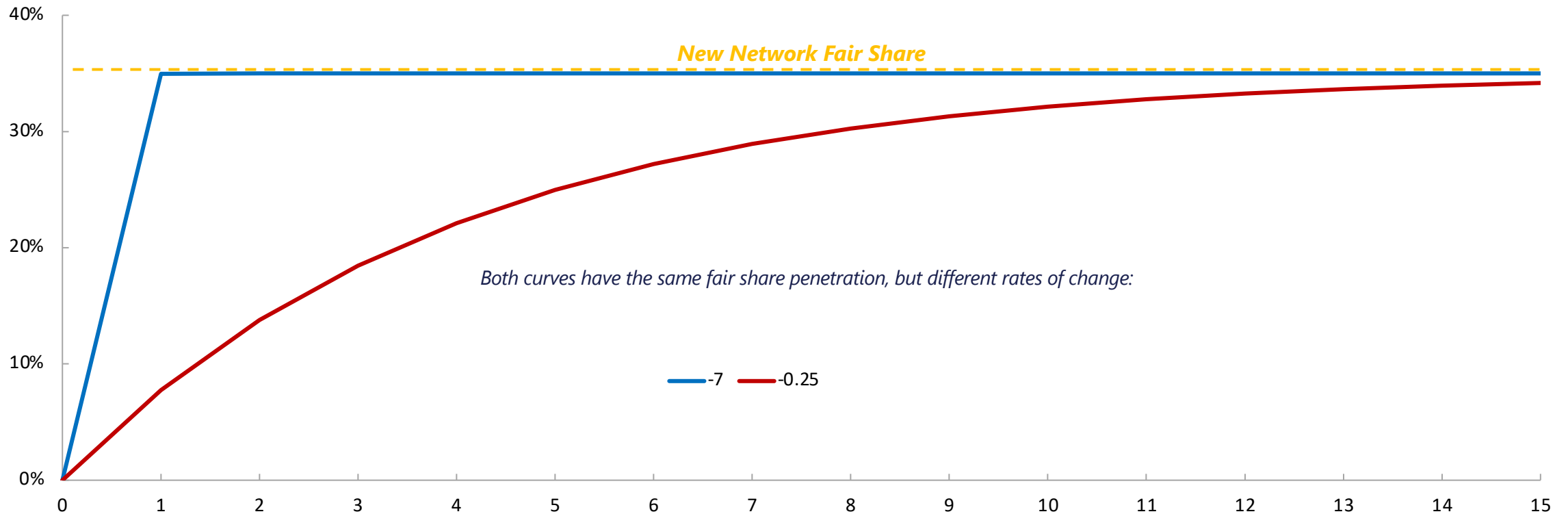


$$\text{Penetration (at time } t) = (\text{fairShare} - \text{startPenetration}) * (1 - e^{(\text{rateChange} * t)}) + \text{startPenetration}$$

Rate Change: Set by user to represent historical rate of decay for legacy technology -0.00001 to -7.0 value range, with -0.25 being representative of recent market trends

Tip: Set BAU start penetration = 0 and rateChange = -0.00001 to model greenfield network builds

New Network penetration curves are based on target fair share and a rate of change factor which determines how steep the curve is



Penetration (at time t) = fairShare * (1 - e ^ (rateChange * t))

Rate Change: Set by user to represent historical rate of penetration for new technology -0.00001 to -7.0 value range, with -0.25 being representative of recent market trends

Tip: Set to 7.0 to reach fair share penetration within one time period (e.g., when modeling building out to contract customers)

In the case when fiber is launched in a current copper market, the curve for copper decline is based on the fiber rate of change rather than historical

