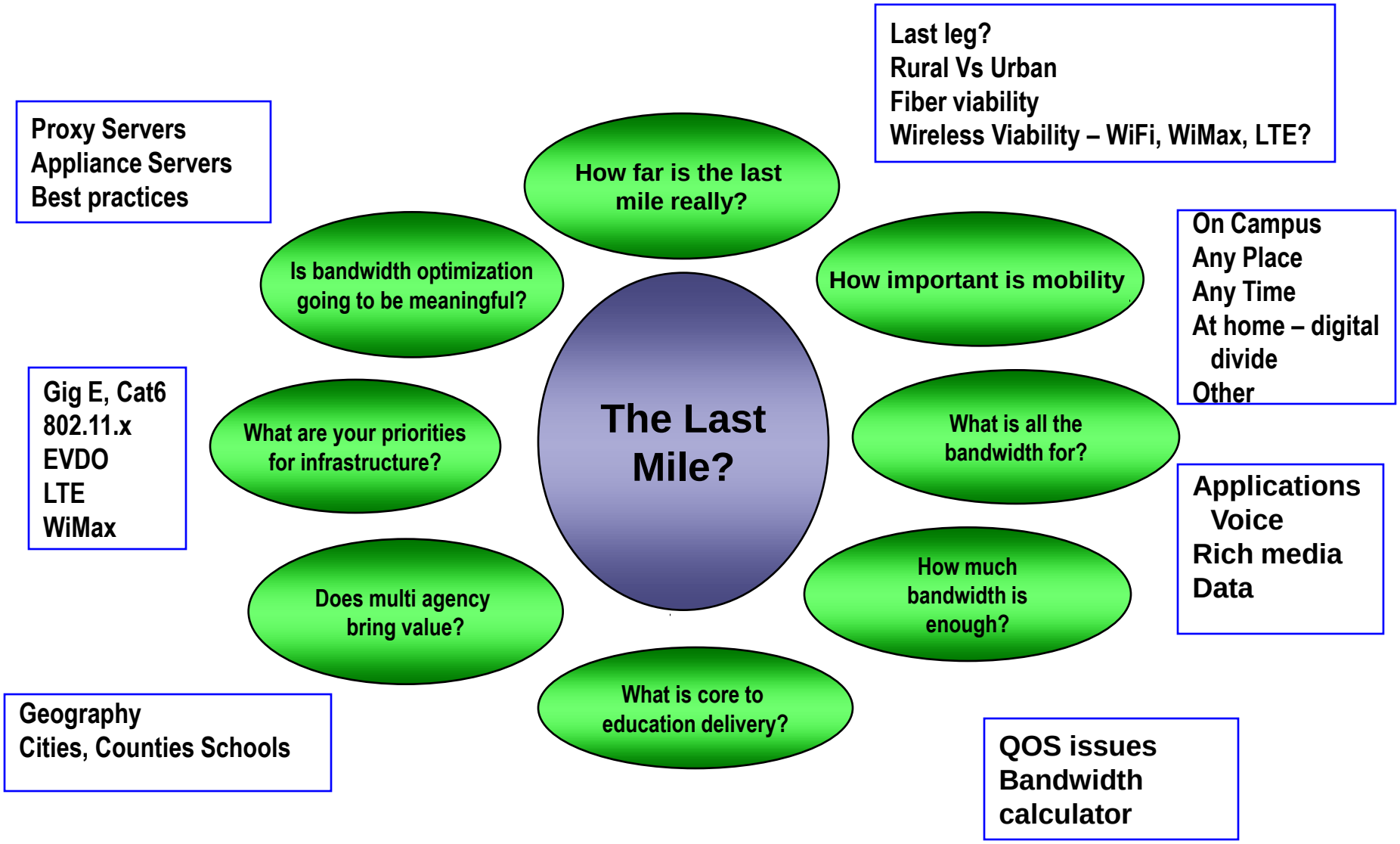
The Last Mile

edIT Las Vegas
13 November 2008

The Last Mile



Cell Phone Polling How-To

- Send a message to this phone number: 41411

- Your message should be:

The word CAST, followed by a 5 digit number representing the answer choice.

Example: CAST 25256 “my message or answer” (no quotes requited)

How important will mobile computing be in delivering a 21st Century Education?

To vote, text a **KEYWORD** to **41411**

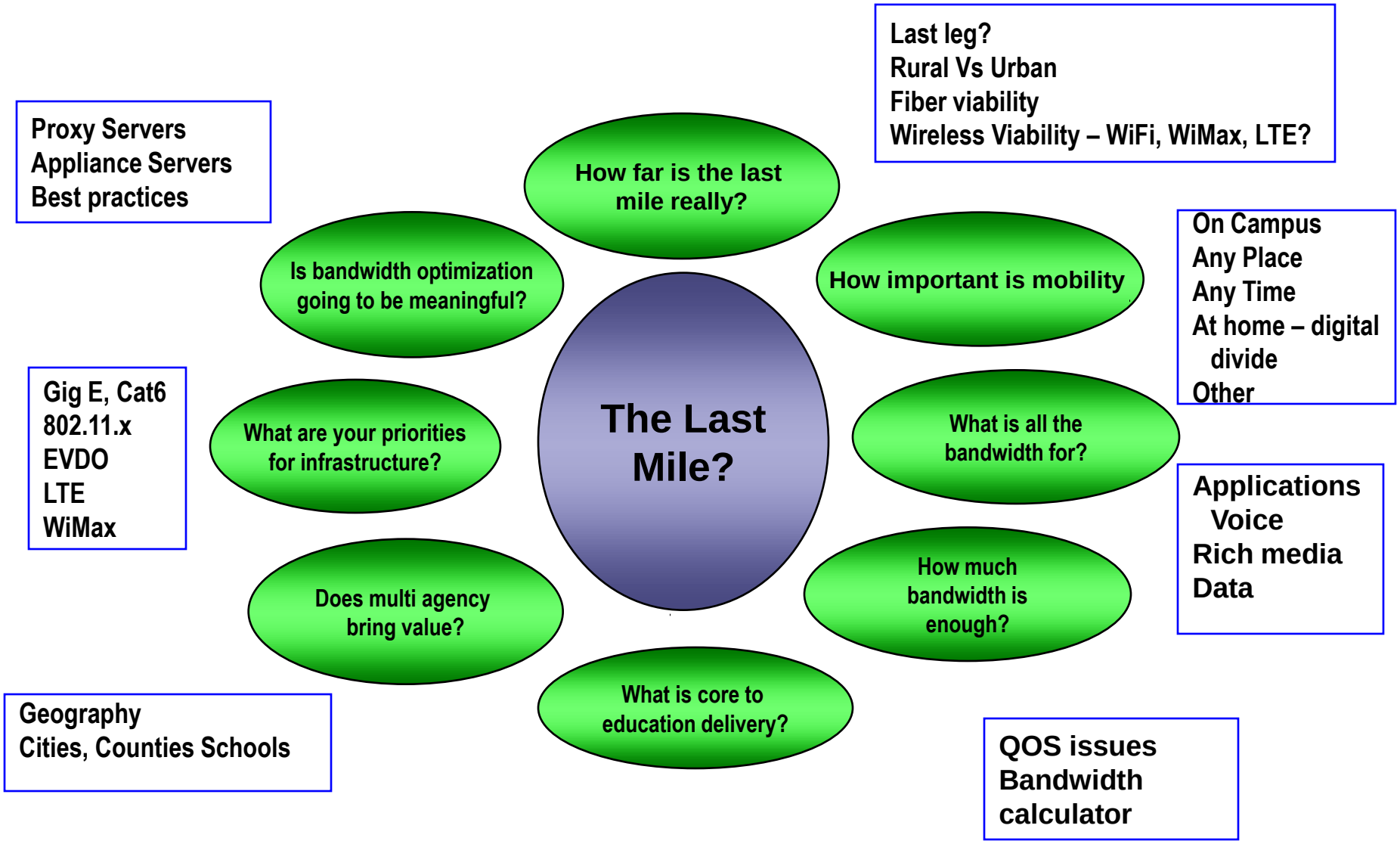
Very Important	**CAST 24570**
Important	**CAST 24571**
So-So	**CAST 24572**
Not Very Important	**CAST 24573**
Not Important At All	**CAST 18465**

How Long is the Last Mile?

Text **CAST 24565** and your message to 41411

No responses received yet

The Last Mile



Historical Perspective

- Once upon a time a dial-up AOL line in the library counted as “internet connectivity”
- After E-rate in 1996, schools turned to broadband, primarily T-1 lines.
- Big disconnects between bandwidth drivers and purchasing decisions

Let’s look at the survey results

What is Your Bandwidth Today? What Will Be Your Bandwidth in 5 Years?

- Definition: Bandwidth per student, in kilobits/second.

- Example: 100,000 students, and an OC-3

- 155,000,000/100,000 =

1.55 kilobits/sec/student

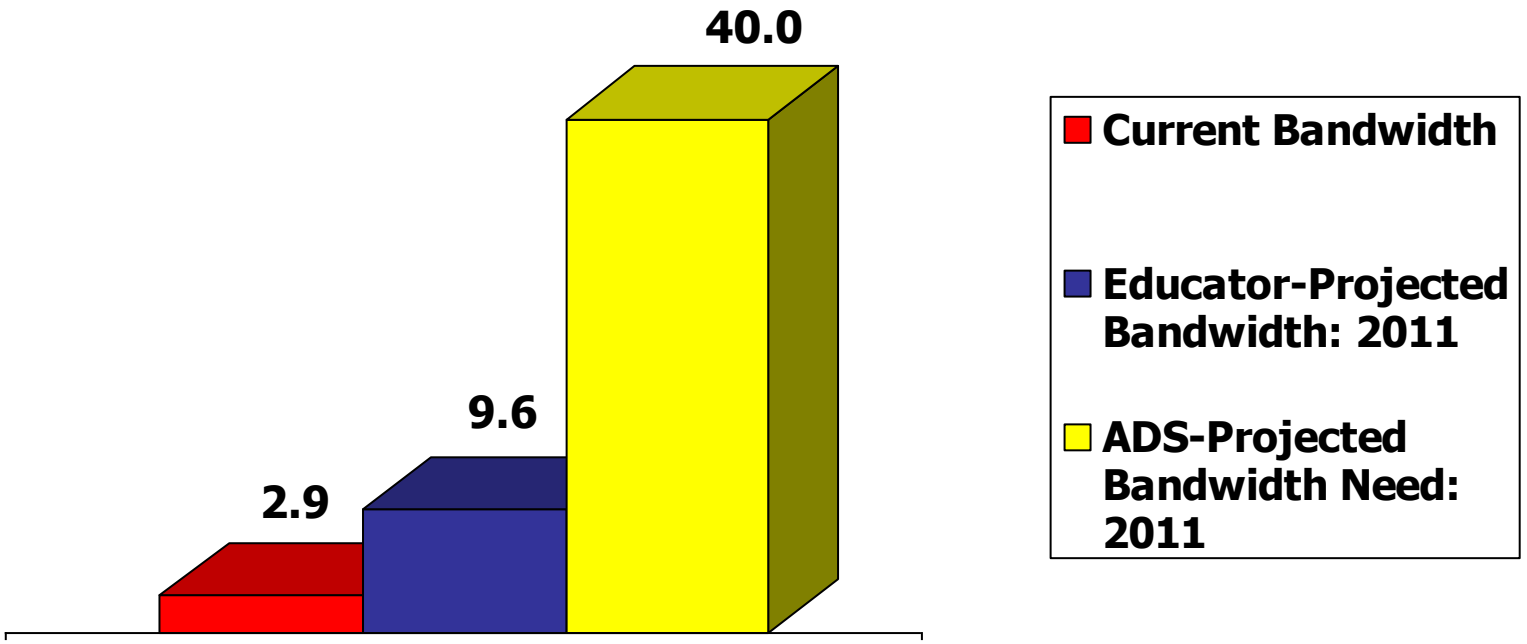
What is your bandwidth per student, in Kilobits/second/student, today? What will it be in 5 years?

Poll Ever

Text **CAST 24557** and your message to 41411

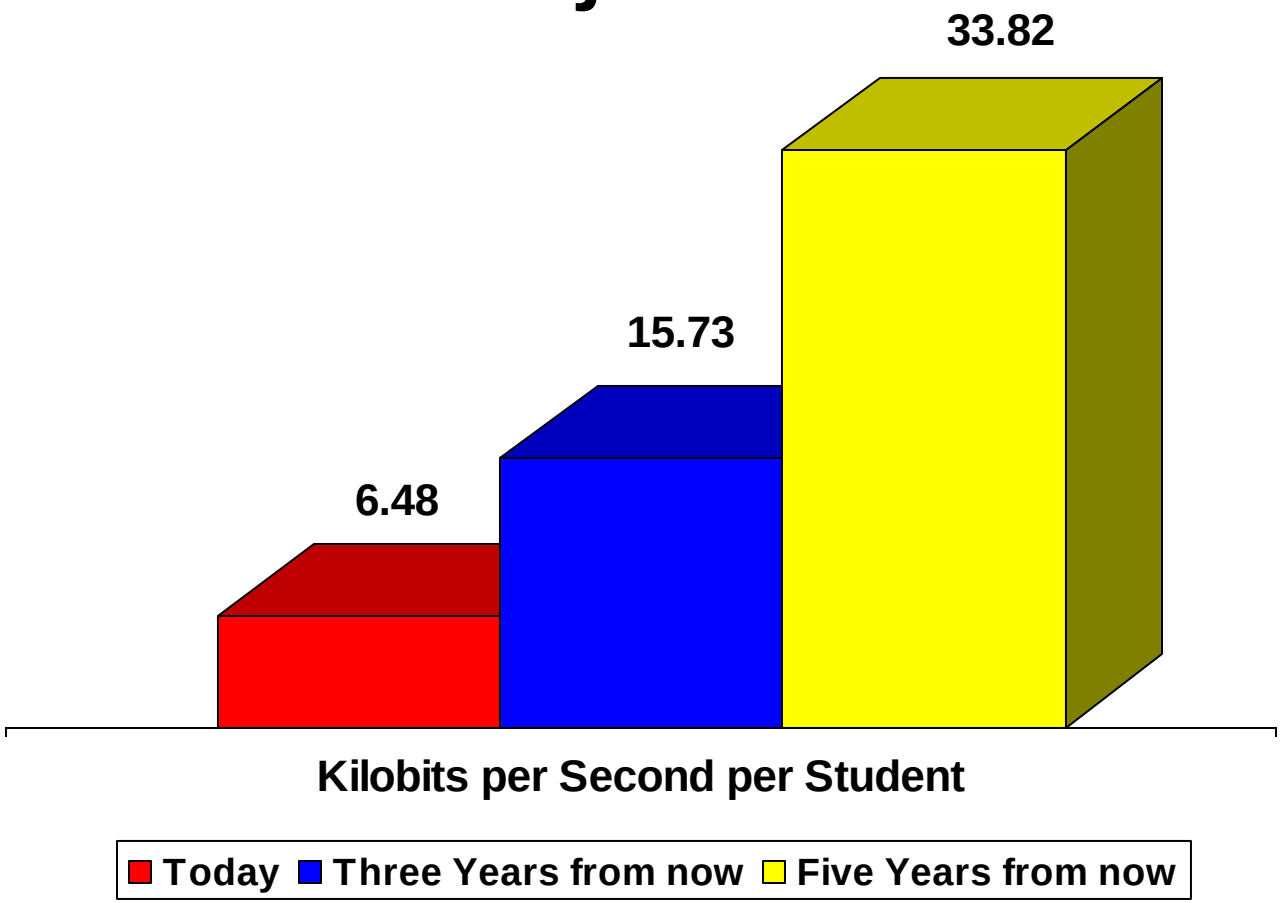
2006 Bandwidth per Student Projection

Kilobits per second per student



What is the actual available bandwidth to the Internet on a per student average basis today in 2006? Note that this is a new way to define bandwidth.

2008 Bandwidth per Student Projection



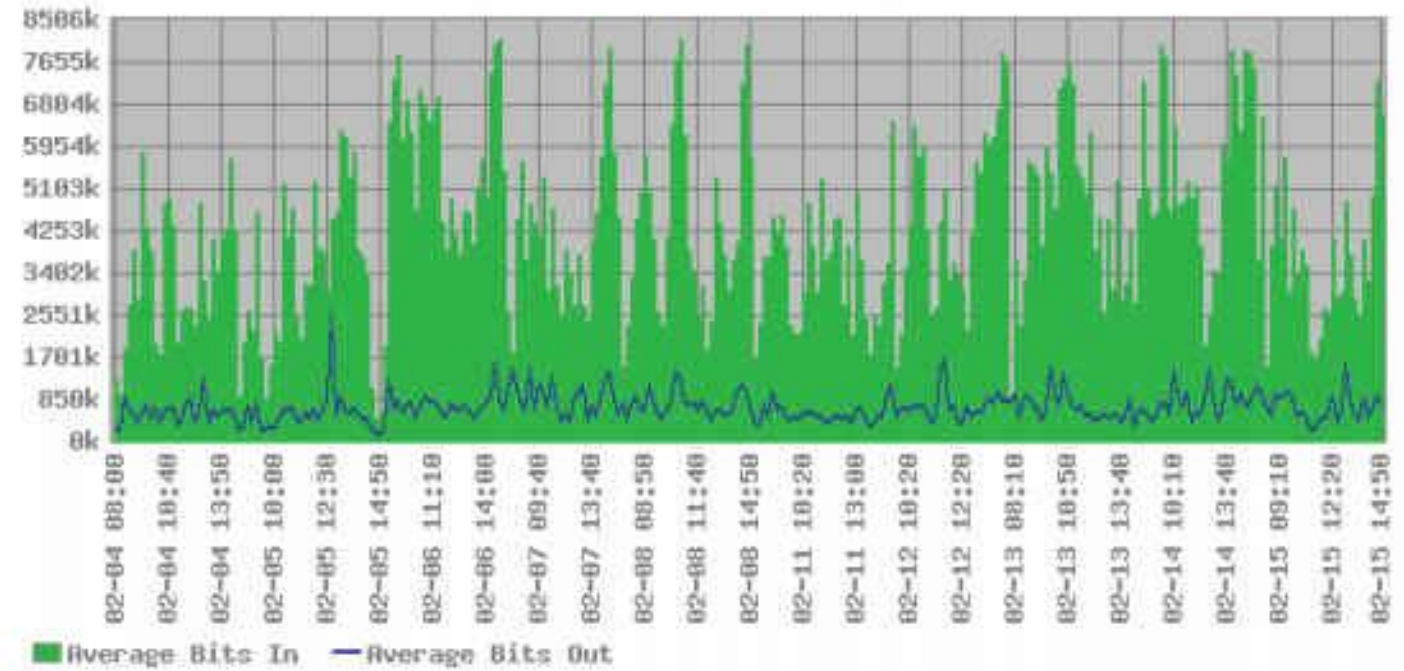
What is your total aggregate bandwidth, between all schools and district buildings and the Internet via your ISPs? How do you expect bandwidth per student to increase in the future?

What is Causing Bandwidth Growth?

- Web page size is growing
- Web application use is growing
  - Online education growing at 40% a year
  - Online assessment growing at 30% a year
  - Online research growing rapidly
  - Use of bandwidth intensive applications such as streaming video is increasing
- More machines
  - Laptop use is growing at 25% a year
- Desire for ASP hosting to cut local costs

Peak Load Rarely Considered

- All our bandwidth calculations are just averages.
- However we know peak load is an important factor in school bandwidth usage.
- When the bell rings, bandwidth spikes.



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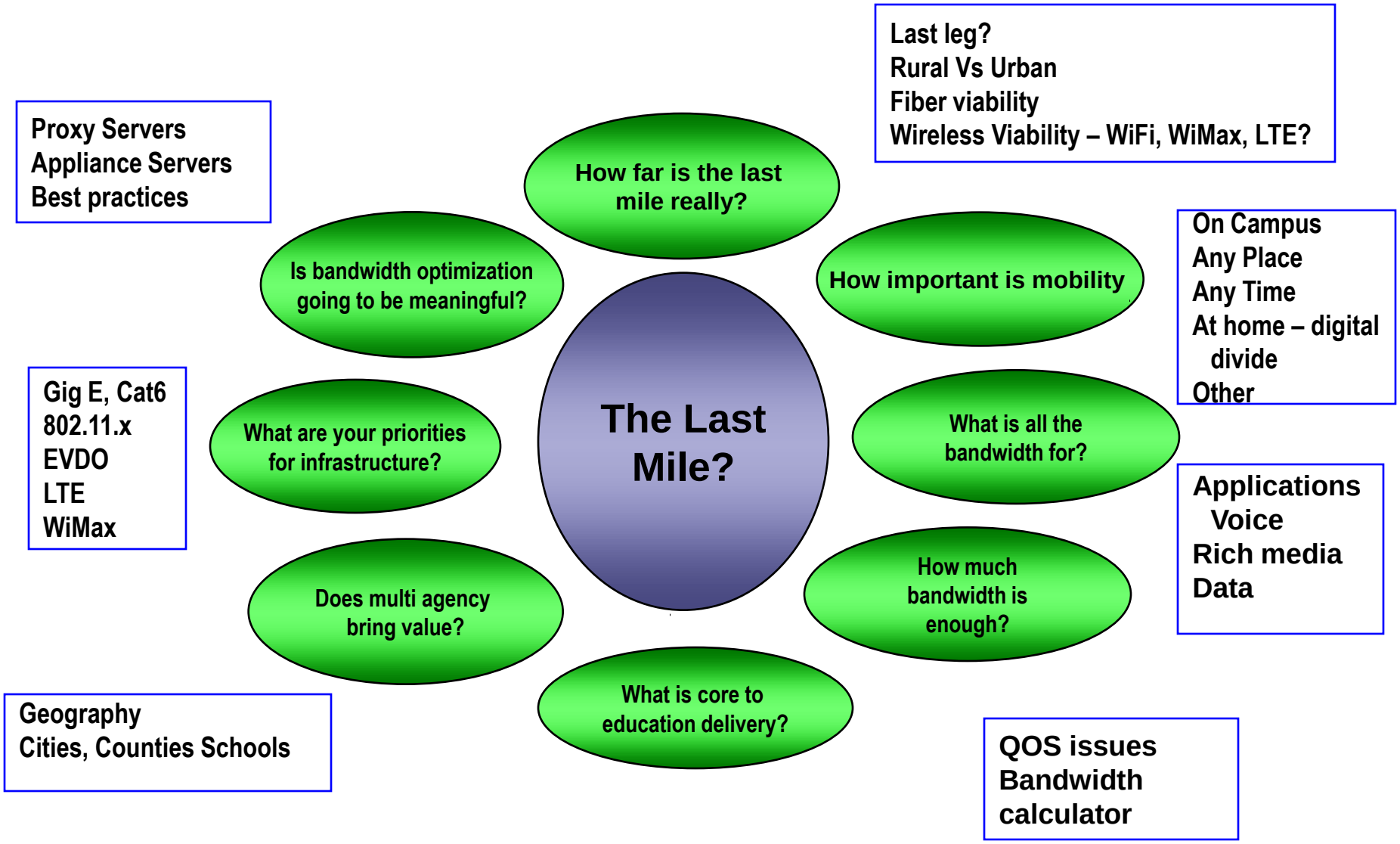
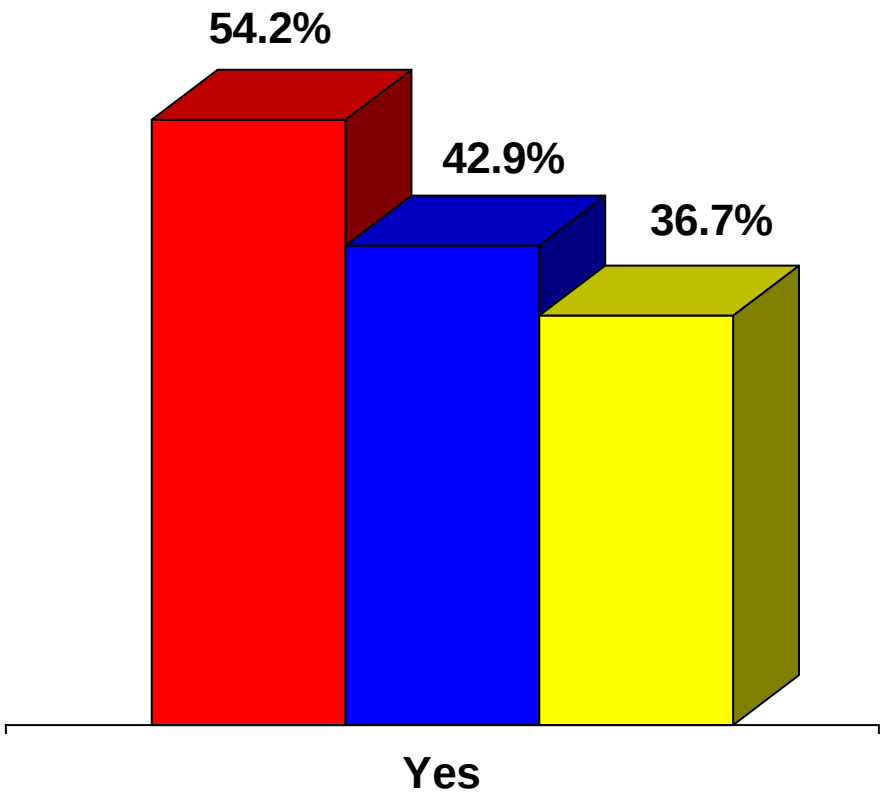


Future Funding Challenges

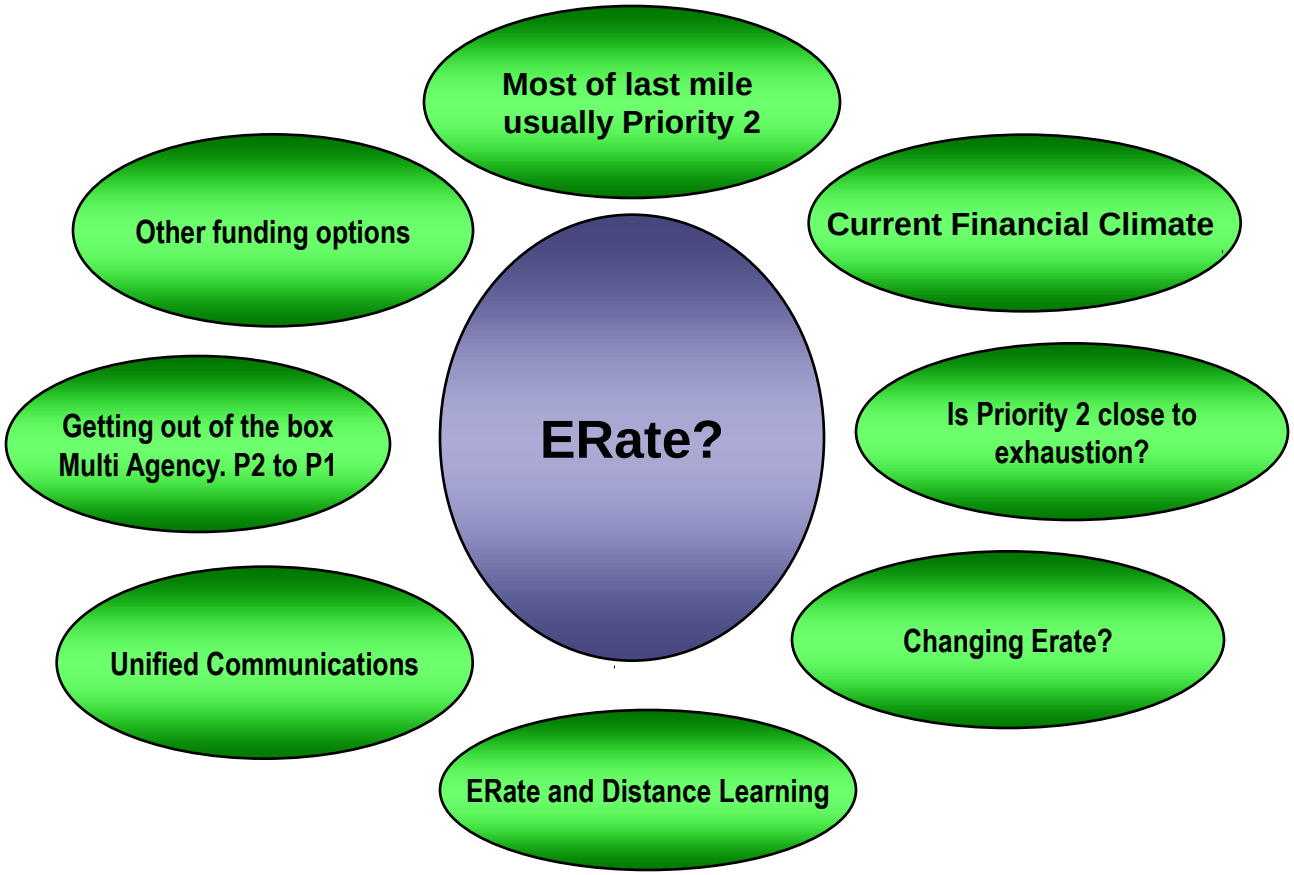
Pct. of Respondents
Multiple Answers Allowed



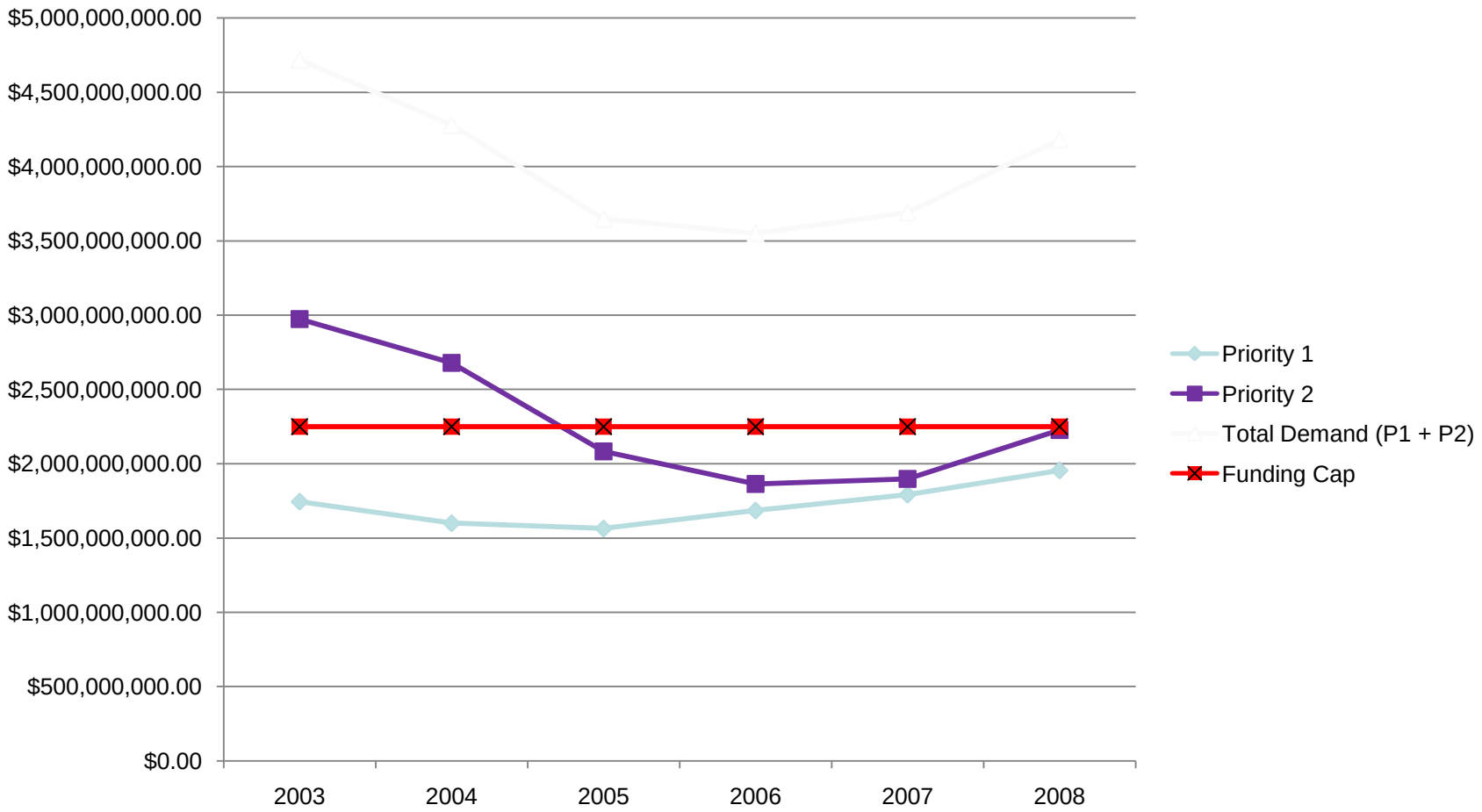
- **Do you foresee a problem obtaining sufficient funding, regardless of the source, for your required bandwidth?**
- **Do you foresee a problem with E-Rate funding your future bandwidth needs at the current percentages?**
- **Do you foresee a problem obtaining sufficient bandwidth, regardless of your ability to pay?**

Do you foresee problems with bandwidth funding?

Paying for The Last Mile

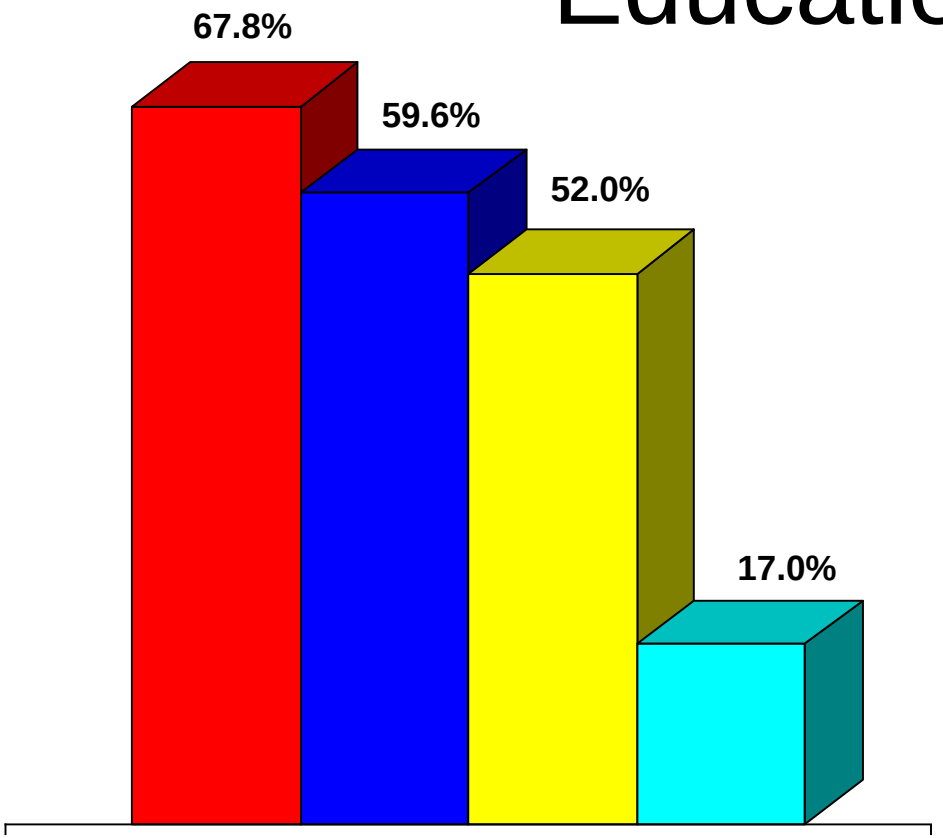


E-rate Funding: So Far



E-rate Funding Demand, P1 & P2: FY2003 – 2008

Bandwidth Leveraging is Impeding Education



- Application restrictions, such as no streaming media or music file sharing
- Proxy servers
- Application specific caching appliances or local application content servers
- Burstable bandwidth from your ISP

Pct. of Respondents
Multiple Answers Allowed

Have you used any of the following to leverage the existing capacity of your bandwidth? Please check all that apply.

Key Points

- We have a school Bandwidth Crisis
- The Crisis is impacting education
- The Crisis has multiple dimensions
- The fixes are not necessarily cheap or quick
- Action is required now!

Recommendations

- Build five year bandwidth usage models for each application area
- Look at alternative models – applications and connectivity
- Get the word out to policy makers and legislators
- Get behind national bandwidth recommendations, such as SETDA's.
- Lobby to expand E-Rate funding to current need levels and have it indexed upwards each year. (In 1996 $2.25B was just fine. Not now!)
- Urge a re-look at what constitutes a priority 1 service.

  e.g. WiMAX, EVDO, LTE
- Special considerations for geographically challenged schools

Act NOW!