Working in the telecom industry these days often feels similar to playing on a sports team that hasn’t won a game for a whole season. Often the best way to overcome a slump is to try new tactics, or to look at the playing field in a totally different way.

We asked five top telecom consulting firms for their ideas on how to beat the slump. They came up with seven — and we were delighted by the creative thinking that clearly had gone into each.

FOCUS ON ROA, NOT ROI

The challenging economy has forced equipment vendors to add a few financial payback slides to their PowerPoint presentations. And the metric thrown into every service provider’s face is return on investment (ROI). Some vendors with deeper pockets have paid large consulting firms to add once trendy late 1990s terms like economic value added (EVA). But crude calculations and fancy graphs will not restore carrier profitability.

What is needed is better asset use, reflected in return on assets (ROA).

Instead of producing boastful press releases that showed they had matched their counterparts’ infrastructure, startup carriers like Metromedia Fiber Networks, XO Communications, Level 3 Communications, and Global Crossing should have demonstrated how they were going to meet their big competitors’ revenue/property, plant and equipment ratio. This old-fashioned, but useful, metric can be the best predictor of bankruptcy, particularly in capital-intensive transportation businesses. Telcos are in that category, despite all the “value-added” nonsense tossed around the last few years.

One of the most exciting NASDAQ IPOs this year will not be technology
startup, but the hip airline JetBlue. And it has a lesson to teach start-up telcos.

Typically, airlines and large telcos have similar revenue/PP&E ratios — around 0.6 to 1.0. Profitable JetBlue for example, has a ratio of 0.88, which is actually higher than United’s 0.64.

Contrast that to the telecom world, where MFN’s $4 billion of PP&E create an annualized revenue stream of just $360 million, a paltry 0.09. Meanwhile, WorldCom’s $39 billion of assets create nearly $35 billion of revenue, for a ratio of 0.9. MFN can brag about matching large carriers’ capacity, but JetBlue boasts about lower available seat mile costs than the majors. Similarly, a smart telco startup should be touting lower DS-0 mile costs than the incumbents, not how it could build a large network with cheap capital.

With an intense focus on capacity planning, JetBlue operates 100 flights a day, about 5% of the 2,000 flown by major airlines, and is not ashamed of its smaller route network because its profit is envied by its larger money-losing counterparts.

Of course, it’s ridiculous to swing 180 degrees away from previous construction practices. Routes with strong prospects still need to get built — even if customer contracts have yet to be signed — but only when existing city pairs generate enough cash to sustain new investment. This is the best way to increase ROA, and to remain solvent. — Dave Gross, Communications Industry Researchers

INCENT CUSTOMERS TO PRIORITIZE TRAFFIC

With the telecommunications industry in a rut and most players looking for some path out of the mess, several lobbying groups, industry forums and other entities have floated key political and economic influencers with proposals to jumpstart the sector and the economy at large using broadband technologies.

One proposal from TechNet, for instance, calls for a “Man To The Moon”-type program to make 100 Mbps available to 100 million homes and small businesses by the end of the decade.

Up to $1 trillion worth of equipment is required to jumpstart the path toward such a 100 Mbps optical-based national infrastructure, according to TeleChoice estimates — and that’s just in the first five years of the effort. And having to absorb $1 trillion in investment requirements can destroy even the best network capital budgets.

TeleChoice has estimated the impact that 100 Mbps access initiatives would have on carriers’ long-haul and metro networks using the model for advanced capital planning (MADCAP) framework.

MADCAP is a comprehensive, market-specific modeling tool designed to assist carriers in making critical capital investment decisions. The MADCAP framework enables extensive what-if scenario playing as part of the carrier’s strategic planning activities. For this analysis, TeleChoice has loaded the model with assumptions covering extensive broadband deployments of 100 Mbps building to 100 million homes and small offices by the end of the decade.

With a starting assumption that services offered over these broadband connections would be similar to the way service providers offer IP services today, the results are ugly for everyone except the equipment vendors who might sell hundreds of billions or trillions of dollars of equipment to create the necessary infrastructure. Margins are thin or negative with no clear path to payback on the huge investment involved.

So what does it take to fix the model? Some relatively minor changes could have a tremendous impact on the financial model of broadband deployments. The first is in the way the network is designed to accommodate peak traffic load, and the second is in the way the IP services are actually offered to customers.

The key to carrying broadband traffic profitably across the network lies in what we’re generically calling “traffic shifting.” For a reasonable end-user experience, packet networks are designed around peak loads. Traffic shifting is the attempt on the carrier’s part to move traffic around so that the peak load is lower, allowing the network itself to be more streamlined and balanced. In our analysis, the effect of this shifting represents a $250 billion impact on capital expenditures, potentially reducing optical transport costs from more than $800 billion to less than $600 billion.

However, a more important change is on the profitability of services. Modeling the aggressive growth in consumer and business Internet and broadband adoption represented in these proposals results in a 100-fold increase in industry IP revenues.

In the non-shifted scenario, this revenue growth yields a 10% margin; in the traffic-shifted scenario, it yields a 31% margin. Cumulative profit over the 2002 to 2006 period is also dramatically different: The non-shifted scenario yields less than 15% of the capex while the traffic-shifted scenario yields 45% of the capex.

In short, if the industry fails to implement effective traffic shifting, the incredible investment required to achieve these aggressive broadband initiatives will never be repaid. However, with moderate traffic shifting, the scenario dramatically changes and the recovery of the required

continued on page 24
investment becomes quite likely. The fundamental issue is whether traffic shifting will actually occur. Based on our experience with frame relay and ATM, service providers will need to provide meaningful financial incentives for their customers to mark some traffic as low-priority and shiftable (Figure 1).

In IP, one must think in terms of both peak-hour and peak-instant. Because IP networks do not handle the peak-instant well if it exceeds the network’s capacity, service providers have traditionally managed this by throwing more bandwidth at the network. In today’s capital-starved environment, this approach cannot continue.

For simplicity’s sake, we’ll assume customers can use three levels of priority: high, standard, and low. In defining the service and configuring the network, traffic for specific flows is set to one of these priorities.

Most important for our discussion, the prioritization comes into play when there’s congestion in the network at a given router. When this happens, the high-priority flows are sent through, and the low-priority flows are buffered. The standard-priority flows are either buffered or sent through depending on how bad the congestion. As soon as the congestion clears, the buffered traffic is forwarded.

The net result is that packets identified as low priority get delayed by a small amount of time until the peak-instant has passed. Thus, the amount of traffic shifted directly translates into the reduction in capacity that the network has to be built to handle (Figure 2).

So how do service providers make this happen?

Service providers must radically redefine their offers to customers, incenting them to shift their traffic off the peak hour and to mark their delay-insensitive traffic as shiftable off the peak-instant.

Fully achieving these goals likely requires a move to usage-based pricing, with non-shiftable packets during peak traffic periods receiving the highest price and shiftable packets during non-peak traffic periods receiving the lowest price.

If properly planned and implemented, this new service model will result in three key results:

1. Service providers can reduce their operating cost per shiftable byte of traffic carried more aggressively than they realize revenue reductions from dis-
sensitive applications, such as voice and video. Because this traffic will be carried at a premium price, these increasing revenues will significantly outpace the increasing costs associated with carrying them.

3. Service providers can incent the use of the network for new applications that take advantage of the inexpensive off-peak bandwidth that are not feasible under today’s pricing plans. — Russ McGuire, TeleChoice

**GET SERIOUS ABOUT DEPLOYING DSL**

The best way to overcome a downturn is to generate revenue, rather than cutting expenses. New revenue not only can improve the net income of the firm, but it also generates new jobs, and thus provides more incentive to consume.

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**Figure 1: Economic impact of traffic shifting**

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenues (B)</th>
<th>Costs without shifting (B)</th>
<th>Costs with traffic shifting (B)</th>
</tr>
</thead>
<tbody>
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</tr>
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</tr>
<tr>
<td>2006</td>
<td>750</td>
<td>650</td>
<td>550</td>
</tr>
</tbody>
</table>

Source: TeleChoice

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**Figure 2: A shift in perspective**

Without packet shifting:

- Network capacity
- Traffic
- Dropped packets

With packet shifting:

- Network capacity reduction
- Traffic
- Packets shifted from
- Packets shifted to

Source: TeleChoice

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*One obvious place for telcos to generate new revenue is in the high-speed access area. There can be little doubt...*
about the demand for high-speed service. One sure way to see that is to look at the results of cable companies. They started years behind telcos in high-speed access technology, but now have a substantial dominance and likely will keep their lead over the next few years. (Figure 3).

Some analysts have suggested that there is no demand or “disappointing demand” for this service. In fact, high-speed access has grown in the face of many adverse factors. Considering its time on the market, high-speed access is growing faster than extremely popular products, including VCRs and cable TV, in their early days. This gain was in spite of:
• The recession
• Numerous resellers of DSL services

Telcos need to get serious about their approach to this market.

If we can’t fund blanket projects such as Pronto, we need to carefully plan for DSL access in the lucrative, high-income suburbs.

Packages need to be designed to include such things as home wiring, networking for homes and small businesses, including printer servers, multiple computers, wireless access, etc. Who knows better how to do these things than telcos? Imaginative advertising should help the non-technical computer user understand why they want high-speed access and home networks. We have yet to see an advertisement for high-speed access that really describes the advantages of always on connectivity, of high-speed Web research and of easy e-mail access.

One of the much-discussed benefits of Ethernet and managed wavelengths is bandwidth-on-demand. This concept has been presented as new and unique to these exciting optical services. But in reality, this capability has been around since the early 1990s with frame relay; it’s just been called bursting.

One of the challenges of building a network that guarantees rapid capacity upgrades is that the backhaul capacity has to be in place to handle them. This has forced Ethernet startups to overbuild at the risk of not meeting the terms of a service level agreement. If at any moment a customer can ask for 20 megabits the next day, the supporting inter-POP links need to have available capacity as well. With aggressive revenue expectations, this has created massively underutilized links in CLEC networks. In contrast, by allowing customers to burst over their committed information rates, frame relay makes backhaul planning much easier, and when experiencing traffic surges, the customer takes no administrative action at all. In the event of contention, the provider just issues credits or prioritizes frames where the discard eligible bit is set to one.

Burstable services remain popular with enterprises because they accommodate the unpredictable nature of corporate data traffic, while allowing service providers to size their networks to a profitable use factor. Additionally, the history of data traffic engineering has taught network planners to expect the unexpected. No one knows when a news story will break and overwhelm a Web server, or exactly when 20 users will simultaneously run queries across the network to reach a remote database.

With optical service startups touting instant bandwidth, some assumed that their larger counterparts offered flexibility for copper connections only. But this is no longer the case.

Large carriers have extended frame relay’s bursting capabilities into the

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**Figure 3: High speed access: US forecast**

![Image of high-speed access forecast chart](source: B and C Consulting)

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Going out of business
• 20% price increases
• Ineffective marketing campaigns
• Limited availability of the product

This is an astounding record, not a symptom of a lack of demand. Do you know of any other similar service that grew by 100% during 2001?

Supply is, however, problematical. We’ve seen Project Pronto of SBC Communications slowed, or really effectively canceled. This was the only real effort by the telcos at overcoming the distance limitations of DSL.

In addition, we continue to see high-dollar suburbs that can’t access DSL because they are served by remote terminals, with no real relief even planned for them. Also, there continues to be an installation problem, in terms of the need for filters. This need for filters has to be enough of a scare factor to turn off many possible sales.

Also there are never advertisements that describe how a home or small business network can solve printer sharing, resource sharing, and back-up problems. — Clif Holliday, B and C Consulting
optical realm. IXCs now offer burstable OC-3 and OC-12 services that retain frame relay-style committed information rates and traffic sampling policies, but ditch the data link control identifier (DLCI) addressing scheme for IP, and eliminate the frame relay formatting.

This type of service can be applied just as easily to Ethernet; and without having to over-provision the supporting backhaul trunks, it provides a sustainable business case for delivering instantaneous upgrades. If anything, Ethernet was the original statistical multiplexing technology. So watch out for catch phrases like “liquid bandwidth” and “instant scalability”; it's just an attempt to make something old sound brand new. — Dave Gross, Communications Industry Researchers

Watch out for catch phrases like 'liquid bandwidth' and 'instant scalability'; it's just an attempt to make something old sound brand new.

TAP INCREASED DEMAND FOR SECURITY SERVICES

Security concerns of one sort or another have traditionally been a central selling point for competitive and alternative local phone service carriers. In the early days of CLEC evolution — when competitive providers were largely competitive access providers (CAPs) — redundancy (in other words, access security) ranked with price as a reason to subscribe to the competitive service.

The importance of route redundancy was made painfully evident on Mother's Day 1988, when Illinois Bell's Hinsdale central office was destroyed by fire, and phone service disruption caused an estimated $250 million in damages.

As a consequence of that galvanizing event, companies such as Teleport Communications Group, later acquired by AT&T, traded on the adage, “Don't put all your telecom eggs in one basket.”

The events of Sept. 11, 2001, have now turned people's attention to telecom networks as a means of securing personal safety, protection and disaster response. With personal safety concerns now front and center in peoples' minds, there is challenge and opportunity for carriers to augment their basket of services to meet users’ security expectations of telecom networks.

One such service is a variation of an emergency notification service now available for CLECs to resell to business, medical, and educational markets. Offered by Intrado Inc. — a player in commercial and safety-related data management, network transactions, call handling and notification technology — this service allows messages to be sent to any location to provide relevant information to recipients through a customer-managed database of names and phone numbers.

With this service, users can reach any group of contacts, based on criteria they define. For example, schools can use the call list functionality to inform parents and students of school closures, upcoming events and other information. Businesses can use the call list to define certain segments of their customer bases and inform clients of their account status or of upcoming promotions.

Sigma Communications, a subsidiary of Sigma Micro Corp., markets a similar product, called Reverse 911, which offers list calling, survey capabilities, and a bulletin board service in addition to emergency notification capabilities. At the time of this writing, it appears that Reverse 911 is not yet available for resale opportunities to CLECs.

Another safety-related solution that CLECs are beginning to see as a revenue supplement involves providing their PBX users with enhanced 911 at the PBX level. However, traditionally, PBX systems have not been capable of accurately specifying the location of the telephone used to make a 911 call. Thus, without adequate location information, emergency help cannot be dispatched quickly.

To solve this problem, CLECs can now offer a product called Private Switch/Automatic Location Identification, also developed by Intrado, which allows a caller to be identified at his or her exact location within a building or campus environment.

RedSky Technologies Inc., offers a very similar product — E911 AutoPilot — through its Distribution Partners Programs.

IQ Labs’ E911, another PBX solution, creates a digital profile for each employee, linked to a unique workspace and telephone number. IQ Labs also has an extensive partner program, offering at least five different categories of partnerships.

Each of these products provides tenants and office building occupants with the security of knowing that emergency help will arrive at their exact location when they dial 911.

In several states, such as Illinois and Washington, current legislation requires companies to provide this capability. Even in states without such requirements, solutions such as PS/ALLI, E911 AutoPilot, and IQ Labs’ E911 are becoming widely sought after by organizations wishing to protect their employees and tenants.

Using existing technologies of safety software companies affords CLECs the opportunity to leverage those companies’ R&D on an outsourced basis and resell an expanding basket of personal security and safety products without incurring the R&D, SG&A and overhead expenses necessary to go to market with these products. — Terry Barnich, New Paradigm Resources Group

BREAK DOWN THE BARRIERS BETWEEN WIRELINE AND WIRELESS SERVICES

As wireless and wireline have become more competitive, the structural separation in the US makes less and less sense. Although it would require a policy change, dismantling the barriers...
between wireless and wireline could increase efficiency, stimulate new applications and services, and enhance competition. Several improvements would result. Cost savings would occur from consolidating multiple organizations, including sales, marketing, back office, and administrative functions.

Savings could be realized from switch integration. The major telco switches (including the Lucent 5E and Nortel DMS 100) can handle both wireline and wireless, but currently telcos have to buy and maintain two separate sets of switches. As broadband and wireless siphon off narrowband wireline customers and minutes of use, current wireline switches will become under-used. At the same time, wireless providers must continue to invest in switches to keep up with increasing demand. Integration would allow the opportunity to shift traffic without proportionate investment. These same benefits apply to IP-based switching as both wireless and wireline move to that technology.

Customers could be efficiently offered unified services that seamlessly integrate the wireline and wireless aspects of voice mail, custom dialing, numbering, billing and household-oriented services.

New mobile commerce and mobile data services would benefit from wireline/wireless integration. Customers will want 100% coverage and reliability for these services.

If the history of voice is any indication, it will be years before wireless will deliver this for data. Enhanced use of the wireline network would hasten universal coverage for mobile commerce and data. This could include transparent wireline (or cordless) backup access to these applications. Wireline integration could also enable microcells in the feeder and distribution networks. Further, this integration might make the economics of landline super-broadband networks more viable.

These benefits extend to the broadband wireless domain, as well, with the potential for integrated service offerings via wireline, wireless LAN, and 3G/4G wireless services. As with voice and narrowband wireless data, there is no guarantee that useful services would emerge or that customers even want them. However, as long as the barriers are there we will never know.

Pumping efficiency and improved services into the system can only help competition within the US and our global competitiveness as well. The investments required for broadband and wireline broadband infrastructures are tremendous. It is clear that only a few players will have the clout to make it happen. Everything that would help the business case is worthy of fresh consideration. — Larry Vanzon, Technology Futures Inc.

**SHIFT INVESTMENT DOLLARS FROM SONET TO IP**

IP is taking over the world, and the sooner telcos face up to that fact, the sooner they can recognize capital and operational savings by shifting investment dollars from Sonet to IP.

Sonet is optimized for voice traffic, which represents an increasingly small portion of total network traffic, while IP is optimized for data, which increasingly will dominate.

The broadband popularity of the Internet continues to drive a backbone growth rate of about 100%. This is not the wildly optimistic 400% suggested in the go-go times of late 2000, but still 100% is a very healthy hockey-stick curve.

Meanwhile, voice still is growing at or near its historic 5% to 8%. This success, but the industry has done it before on many technology upgrades, and the time has come to reap these high payoffs by doing it again. — Clif Holland, B and C Consulting

**Figure 4: Internet traffic projections**

Source: Lightwave Post/911 KD Consulting www.igigroup.com

<table>
<thead>
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<th>Year</th>
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