

**A T & T**

**Cellular Digital Packet Data**

## **Application Guide**

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New ways to dramatically  
increase your revenues  
and enhance service to  
your subscribers with wire-  
less data communications.



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D**



**AT&T**

A burglar cuts the wires on your home security system...and the alarm system still goes off.

A police officer spots an unfamiliar car on your street at night...and uses her wireless terminal to access the motor vehicle database and check the vehicle plate number.

A taxi taking you to the airport runs into traffic...and immediately receives an alternative route and directions from an in-vehicle computer system.

You're on the road, expecting an important E-mail message. You check your E-mail right from your car, using your wireless mobile end system.

Science fiction?

NO.

The wireless data technology that makes all this possible is called **CDPD.**

*It's here. Now. And you can offer it to your subscribers — today.*

**Want to increase revenues and enhance service levels by offering your subscribers wireless data?**

**AT&T's CDPD  
is the answer.**

**Your customers want wireless data.**

**Implementing AT&T's Cellular Digital Packet Data is the best way to meet their data communications needs.**

CDPD is an overlay to your existing AMPS infrastructure. Which means you can deploy CDPD quickly and affordably — simply by overlaying existing cell sites. So you preserve your hardware investment ... and significantly reduce start-up costs.

Service providers who are first to offer the market wireless data gain a tremendous advantage. Now AT&T's CDPD enables you to provide these services — and dramatically increase revenues from new and current customers.

**The new growth opportunity in wireless services**  
According to the Cellular Telecommunications Industry Association (CTIA), there will be as many as 86 million wireless users by the year 2000, with over 17,000 new cellular users added every day. And the big growth opportunity today is in wireless data: Forecasters predict that by the end of the decade, wireless data communication may actually exceed voice traffic on wireless networks.



Wireless data subscribers are business customers who want to use wireless data to tap into their corporate databases, download and upload files, approve credit authorizations, monitor alarms and meters, track their fleets, dispatch field crews, process customer transactions, and handle a variety of other business tasks. With AT&T's CDPD system, you can quickly respond to the current and future demand in your area for wireless data communications.

#### **Multiply your wireless revenues**

If your subscribers aren't already asking for wireless data, they will. *Soon.*

Wireless communications is an extremely competitive business. Experience shows that subscribers will align themselves with those providers who offer them the leading-edge services and conveniences they want. CDPD can enable you to meet that requirement, maximizing customer satisfaction and minimizing churn.

Not only does providing wireless data keep you competitive, but it's also a major revenue opportunity. Carriers who utilize their voice channels to include data can generate increased revenue on top of voice services, by taking advantage of idle space on the voice channel. In the 1990s and beyond, it will be data that fuels significant growth for wireless providers.

#### **A complete AT&T CDPD product line**

AT&T's CDPD allows cellular carriers to handle data communications over the same channels as voice communications, without adversely affecting the quality or quantity of voice traffic.



By offering a complete CDPD product line — the AT&T AUTOPLEX® System 1000 CDPD System — we make it possible for you to quickly and easily implement CDPD on your existing networks and tap into the lucrative cellular data market.

#### **Open systems architecture enables scalable growth**

AT&T's CDPD system is based entirely on an open systems platform. Use of an open systems architecture provides maximum flexibility in upgrading and expanding CDPD networks, allowing subscribers to take advantage of the latest mobile end systems. As your subscriber base expands, so can your AT&T CDPD system — quickly, easily, and economically.

The typical controller-based wireless data system uses a proprietary architecture that limits growth and makes migration to new computing technologies difficult. Finite processing limits system expansion, making it necessary to acquire significantly more infrastructure to accommodate your growing subscriber base.

AT&T has integrated advanced computing technologies into our product, enabling you to rapidly deploy new features and services. Conformance to industry-standard protocols makes AT&T's CDPD compatible with TCP/IP-compatible networks, enabling connectivity with all major public and private packet-switching networks worldwide.

# the **CDPD** advantage

CDPD offers a number of advantages over other wireless data solutions. Perhaps the biggest advantage for service providers is that CDPD makes use of your current infrastructure, preserving your hardware investment and lowering implementation costs.

CDPD is an overlay to the cellular voice network, using existing linear amplifier circuits, antennas, and T1/E1 lines to transmit data. This eliminates the need to install an entirely new data system, making CDPD the most cost-effective wireless data option. The money you save can go directly to your bottom line as pure profit. Or, you can pass the cost savings on to your subscribers in the form of lower prices. It's entirely up to you.

#### **Works with current and future infrastructures**

AT&T's CDPD system is compatible with existing AMPS cellular infrastructures. Use of an open systems architecture enables our CDPD system to be easily expanded in capacity and redundancy ... which in turn maximizes system availability.



CDPD can coexist with TDMA and CDMA technologies. The CDPD system shares channels with analog traffic serviced by TDMA cell sites. When used with a CDMA system, CDPD operates in a separate frequency band for CDMA traffic or on dedicated 30 kHz channels.

CDPD offers analog connectivity as well as seamless migration to digital technologies — including both TDMA and CDMA. This means CDPD will work with whatever infrastructure you have in place. Today and tomorrow. So you have the flexibility of preserving your current applications when migrating to these new technologies.

Not all U.S. cellular carriers are committed to TDMA or CDMA. But the ability to support CDPD on existing AMPS infrastructure is now possible, enabling nationwide ubiquity. This is why CDPD is likely to emerge as the only open standard able to provide national coverage for data communications.

#### **How CDPD works**

Data files are split into packets and sent along idle voice channels at up to 19.2 kbps.

CDPD provides two different modes of operation, depending on the load of voice and data traffic on your network. It can use a dedicated voice channel to send and receive data. This mode is used when the data load is heavy or the data transfer rate needs to be maximized.



In the second mode, called "sniffing and hopping," CDPD moves the data from one voice channel to another, based on channel availability. In this way, CDPD avoids interfering with voice communications by transmitting data during idle periods on the voice channels, maximizing revenues on available spectrum. No dedicated channel is required.

Circuit switched data and analog cellular voice require a dedicated circuit between two points. With CDPD, packet data from multiple users share the same channel, so a dedicated channel is not required. The result is a substantial increase in revenues per channel.

CDPD is ideally suited to applications requiring short bursts of data, such as E-mail or credit authorizations. Circuit switched data is transmitted in a continuous stream, and requires one dedicated channel per user. For this reason, it's typically used for lengthy transmissions involving large amounts of data, such as multi-page documents.



Cellular service companies who offer CDPD provide end users with a single source of integrated voice and data delivery. When CDPD is implemented on the cellular network, subscribers gain access to both voice and cost-effective wireless data services from a single supplier. They have one point of contact for all their communication needs while on the road or away from the office. By comparison, the proprietary wireless data communications products offered by private service vendors provide data only. If subscribers want voice, they have to arrange separate service from another provider.

**Maximize your infrastructure investment by utilizing CDPD on Series II**

The CDPD radios use existing Series II equipment for data transmission. This eliminates the need for separate T1/E1 links, antennas, and amplifiers, making it easy and cost-effective to add CDPD capability to AUTOPLEX Systems.

*The result:* lower equipment costs with uncompromised voice and data communications. You gain significant new revenue-generating capabilities, without having to replace your existing telecommunications infrastructure.

## The AT&T CDPD System ...at a glance

The AT&T AUTOPLEX System 1000 CDPD  
System consists of three components:

→ A Mobile Data Base Station (MDBS) provides radio access, spectrum monitoring, and automatic channel hopping. The MDBS has a modular design where the control module and power supply can support up to six modem/transceiver modules. You can start with one radio, then expand as your traffic grows. Additionally, the MDBS can share capacity on the T1/E1 links from the cell site back to the Mobile Switching Center (MSC).

→ The Mobile Data Intermediate System (MDIS) handles authentication, directory services, packet switching, and gateway services to landline data networks. The MDIS provides efficient, cost-effective access to the CDPD network and interconnection with other MDISs. It incorporates all the performance and functionality required by the CDPD specification including all internal fixed-end systems.

→ The Network Management System (NMS) controls and centrally coordinates all network management functions including network configuration, fault and performance management, and diagnostic analysis. One NMS can be used to manage a single market or an entire region of data service.

## Your benefit from

In approximately two-thirds of all applications, data is sent in short, intensive bursts rather than long continuous streams. This makes CDPD the technology of choice for a wide range of uses including:

- *transaction processing*
- *fleet management*
- *telemetry*
- *E-mail*
- *messaging*
- *on-line point-to-point communication*
- *intelligent vehicle highway systems.*

### Keeping in touch

E-mail is one of the fastest-growing computer applications, with thousands of Fortune 1000 employees now accessing E-mail on a daily basis. CDPD eliminates the need for E-mail users to be physically connected, allowing them to access their mailboxes without a phone line. This increases the productivity of the mobile workforce and enhances communication within the organization. It's an important advantage for your corporate customers who rely on E-mail as a primary means of communicating. And a small price for frequent travelers to pay for avoiding the hassle of finding a telephone port that's accessible and available.



customers can

# CDPD!

Message paging is another application that is enhanced by using CDPD. Traditional paging is limited to receiving short messages on a beeper. With CDPD, you get a full bi-directional flow of information allowing remote users the ability to receive and send data. Mobile users can stay in touch with recent developments and reply to urgent messages more promptly. By responding to critical information right away, you prevent service delays, increase customer satisfaction, and eliminate lost opportunities. For users who keep their mobiles on all the time, this CDPD application eliminates a separate pager unit and the associated monthly bill.

**Authorize credit card orders, search databases, check inventories, and link into a host of on-line services**

E-mail is just one transaction that can be processed efficiently and cost-effectively using CDPD. Your subscribers can use their wireless systems to check databases and records, authorize credit card purchases, enter orders, check inventory and order status, update work orders, and connect with a wide range of on-line services, from home shopping to electronic bulletin boards.

Life moves at a blistering pace. Your customers place the highest value on convenience and speed. Wireless data gives you a strategic edge in meeting the communications needs of today's time-pressed buyers. Availability of product information at the customer's fingertips can make or break a buying decision. Authorizing credit and completing the transaction on the spot also helps close the sale.

At any instance, from any place, customers can connect with services that in the past could be accessed only through a physical connection. Transactions can be processed more rapidly and easily. Customer satisfaction is enhanced. More sales are made.

**Send critical data over the airwaves**

No longer must the mobile user search for a phone jack to send or receive data files between their laptop and their desktop. With CDPD, workers can remotely access their corporate databases or home files wherever they are. Wireless systems can be used to dispatch vehicles, manage fleets, remotely monitor and control meters, enter daily sales orders, and enhance business travel.

Each type of business has its own requirements. The following pages outline typical application scenarios among some of the heavy users of wireless data communications. AT&T's CDPD System can enhance productivity and improve communications for virtually every subscriber you are now serving. You can ensure retention of these valuable customers and actually increase their system usage by offering them CDPD data services — now!

## Telemetry and remote monitoring

Any business that utilizes remote monitoring or requires this type of service can save money and improve customer service using wireless data.

The servicing of vending machines, for example, can be greatly improved when the machine automatically alerts a central dispatcher that it needs to be stocked or serviced. Usage statistics can be logged and transmitted to identify those locations with the most traffic. Vending machine distributors — there are more than 1,000 nationwide — can then relocate machines to busier locations.

In business and home security, use of wireless alarms can significantly reduce the cost of ownership while enhancing system reliability. Wireless telemetry defeats thieves who can disable conventional security systems by cut-

ting wires. In addition, cellular voice allows police or security services to be called if phone lines are also cut. This makes CDPD an attractive technology to the more than 7,800 alarm and security system companies nationwide.

Every day, thousands of people conduct banking transactions at more than 109,000 Automated Teller Machines (ATMs) across the country. Banks can equip ATMs with wireless telemetry units to alert them when machines are malfunctioning or out of cash. Also, CDPD allows ATMs to be installed anywhere, not just where phone lines are available.

At the office, photo copiers, fax machines, computers, and other equipment can be equipped with telemetry units. These devices automatically let the service company or central office know when the machine needs to be serviced or repaired.

Remote telemetry units can be used to monitor material levels in bulk storage tanks containing products or raw materials. A hospital, for example, would use such a system to monitor its supply of bulk liquid oxygen. The telemetry system warns you when tank contents are running low and enables coordinated scheduling of bulk gas deliveries.

There are thousands of businesses in your service region using remote monitoring. Now you can give them a sustainable market advantage with CDPD.



# Monitoring



# Credit Card

## Authorization



Credit card authorization terminals are in nearly every retail establishment. But customers don't always have rapid access to them. And if you make customers wait too long, you'll lose the sale.

With wireless data, credit authorizations can be made without a physical connection. That means you no longer have to force your customers to wait in a specific area to make purchases. Your clerks can go to customers on the floor — and process their purchase transactions right on the spot — using portable mobile end systems. Shoppers will rave about this new service!

In addition, many retailers conduct a substantial amount of business away from their stores, selling products at concerts, fairs, sporting events, swap meets, flea markets, and other locations where phone lines are not readily available. Merchants can use CDPD to electronically verify credit away from the store, increasing sales at remote locations.

By offering consumers an additional form of payment — credit — merchants can increase impulse buying, both in-store and on the road. And the availability of credit card authorization devices enables retailers to protect themselves from credit card fraud. They also save money by eliminating the fees credit card companies charge merchants for nonverified transactions.

CDPD. No merchant accepting credit cards should be without it.

## Insurance: a premium market for wireless data services



With more than 214,000 insurance agencies in the United States, the insurance business represents a major market for wireless data services.

Insurance today is a mobile business: Agents conduct the majority of their selling outside their offices, at a client's home or place of business. Agents who make the most efficient use of their time on the road are usually the most successful. By utilizing wireless data services, insurance businesses can achieve new levels of productivity and performance.

Wireless data has the potential to revolutionize the insurance industry. For example, when agents are out of the office, new sales leads can be instantly transmitted to them. This provides salespeople with up-to-date customer and prospect information they would normally have access to only at the office. The result: more appointments and more sales.

Or consider transaction processing. With wireless data, an agent can instantly submit a new customer application, speeding policy approval and the completion of the sale. The insured will be amazed and impressed when the application is processed and even approved during the sales call. Electronic processing of policy applications reduces paperwork and speeds approval. It also decreases costs associated with back-office data entry and processing labor.

On an accident claim, instantaneous wireless transmission from an adjuster can speed processing, dramatically enhancing customer service and satisfaction. Insurance professionals can also use on-line, point-to-point communications for exchanging new business quotes, motor vehicle records, bank information, and other critical files. Business documents get written faster, increasing premiums and cash flow.

By offering CDPD to your insurance customers, you can help streamline their businesses by solving many of their communications concerns. And since agents also need easy access to voice calling, the ability to supply both voice and data is a real plus to the insurance market.



## AT&T CDPD helps transportation firms keep on trucking

Speed of delivery, reliability of service, and customer communications are what differentiate one trucking company from another. CDPD wireless data can enhance any trucking company's ability to deliver in all three areas.

The transportation business involves tracking an enormous amount of data: the location of vehicles, the status of shipments, the contents of trucks, pick-up orders, vehicle fuel and maintenance records, routing and destination updates.

Wireless fleet management is the fastest and most convenient way to communicate this information. By providing dispatchers with an instant means of tracking their fleets and verifying delivery, trucking companies can keep consignees up-to-date on shipment status — and be alerted the instant a delivery has been made.

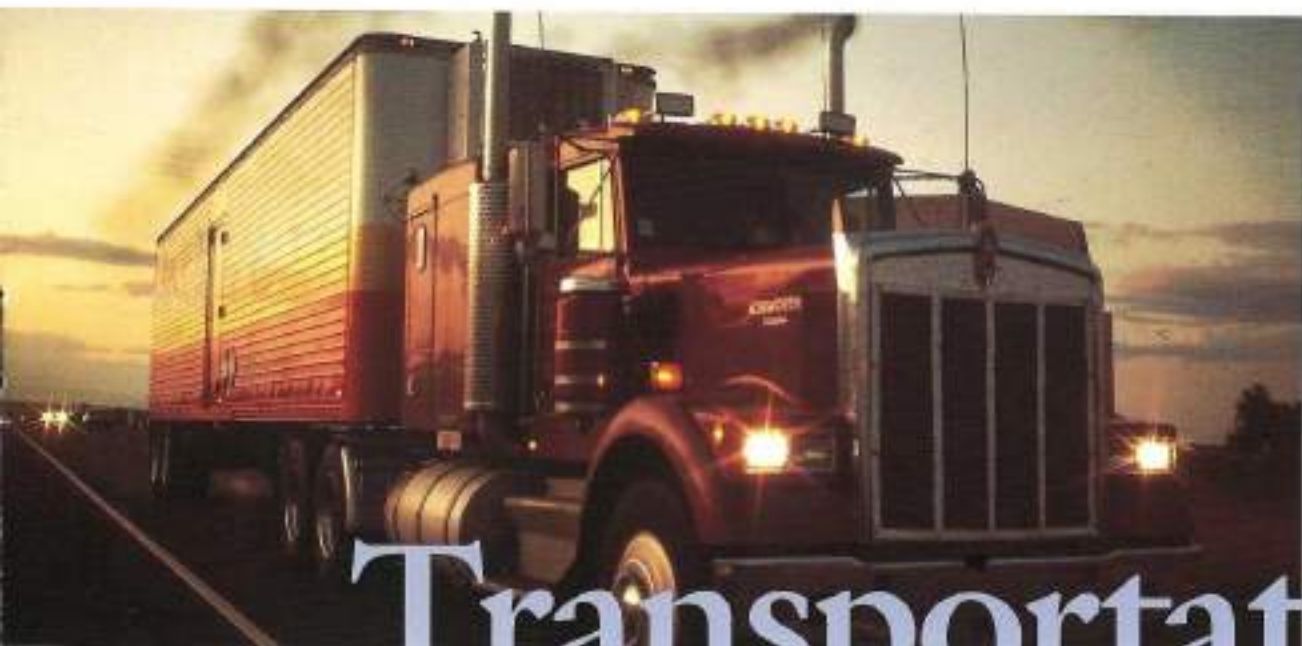
Dispatchers can also use wireless data to communicate the optimal route to drivers, reducing fuel costs and speeding delivery. The uncertainty of not knowing where a critical shipment is ... or when it will arrive ... is eliminated.

Customer service improves, enhancing the trucking company's reputation.

In addition, data from fleet management systems can be used to enable more rapid and accurate billing, reducing complaints and increasing revenues. Drivers equipped with mobile end systems can communicate more readily with dispatchers. The time-consuming task of pulling into a truck stop or diner to find a payphone is eliminated.

Restricted voice calling solves communications needs while controlling costs and eliminating fraud. And transaction processing enables drivers to capture and transmit all transaction details, from time of delivery to recipient signature, electronically.

Trucking companies are a large potential market for your services. There are more than 64,000 trucking companies nationwide ... many in your service region. Why not provide CDPD today and gain a competitive edge in meeting the unique voice and data needs of this mobility-based business segment?



# Transportation

## Making field service personnel more productive

Today's lifestyle is fast-paced. Consumers don't want to take time out of their busy schedules to bring their broken products "into the shop" for repair. As a result, there is a growing trend to have equipment and appliances serviced at the customer's location. This in turn has created a rich potential market for wireless data in the nation's field service organizations.

These field service operations include both in-house and third-party organizations that repair and service industrial equipment, office machines, and consumer appliances. Collectively they employ nearly 3 million technicians who, by using wireless data, can stay in contact with the office, schedule service calls, order parts, and coordinate schedules.

With E-mail and paging, field service reps can keep in touch and are easier to reach. Tracking of schedules, routes, and spare parts inventories can now be performed on-site. When a customer requests service, the dispatcher can instantly locate the closest technician with the right spare part inventory. Service is rendered faster, with more service requests resolved on the first call, maximizing customer satisfaction.

Using wireless data communications, field service representatives can query a database to check the type of equipment the customer owns and the spare parts inventory on hand ... before driving to the repair site. This eliminates the need for costly multiple visits.

Drawings, schematics, wiring diagrams, and other data can be accessed on-site to troubleshoot equipment problems. Complex test results can be transmitted to a central point for remote diagnosis. Reps can also use wireless data communications to receive on-the-spot credit authorization for repairs, parts, or supplies not covered by the customer's service contract, eliminating post-visit billing.

Field service is a tremendously competitive business today. Once warranties expire, customers no longer automatically buy service from the original manufacturer. Instead, they look for a field service organization that will provide the best service at the most affordable cost. Wireless data and voice services can make any field service organization more efficient. And you can help them achieve this increased efficiency — by providing them with CDPD capabilities.



# Field Service



## Technology: a driving force in the taxi and limousine business



CDPD is the ideal way for dispatchers to stay in touch with their fleets. Wireless voice enhances communication between dispatchers and drivers, while wireless data enables fleet owners to increase revenues through a variety of value-added services including electronic credit card authorization, intelligent vehicle highway systems and fleet management.

Wireless data's ability to increase the efficiency of fleet management is — on its own — a justification for installing the system. Drivers can be immediately alerted when customers alter pick-up times, locations, or destinations. Dispatchers can then send the nearest driver, speeding service and reducing fuel costs.

When drivers have flat tires or other vehicle failures, they can instantly notify the dispatcher so a backup vehicle can be sent.

In addition, CDPD can assist drivers who have a limited knowledge of directions. Vehicles can be equipped with wireless terminals that communicate with a central database. The database provides directions and best routes. This saves time and compensates for a driver's lack of familiarity with the area, eliminating a major source of customer complaints.

Another area where CDPD can help make taxi and limo businesses more efficient is with credit authorization. Today, more and more customers want to pay for fares with credit cards. Wireless transaction processing enables drivers to verify credit right from the car — eliminating both potential fraud and penalties credit card companies assess for nonverified transactions.

What's more, drivers will always need to have voice conversations with dispatchers. When it comes to talking, CDPD offers taxi and limo companies a number of advantages over traditional two-way radios. These include more reliable service, better voice quality, and greater privacy.

Restricted calling gives drivers the voice capabilities they need while controlling abuse and fraud. The fact that you can offer your customers voice and data services on the same system is also a benefit.

Almost every town has a number of taxi and limousine companies needing wireless data services. Nationwide, the number of taxi and limo fleets is nearly 15,000. As a business based on mobility, this industry is a prime market for cellular data and voice.

## Wireless data delivers added value to messenger services

There are almost 1,500 messenger and delivery services in the United States. Every day, they dispatch thousands of messengers — on foot, bicycle, moped, car, and truck — to deliver important packages. Wireless data provides a cost-effective solution for linking these messengers to central dispatch.

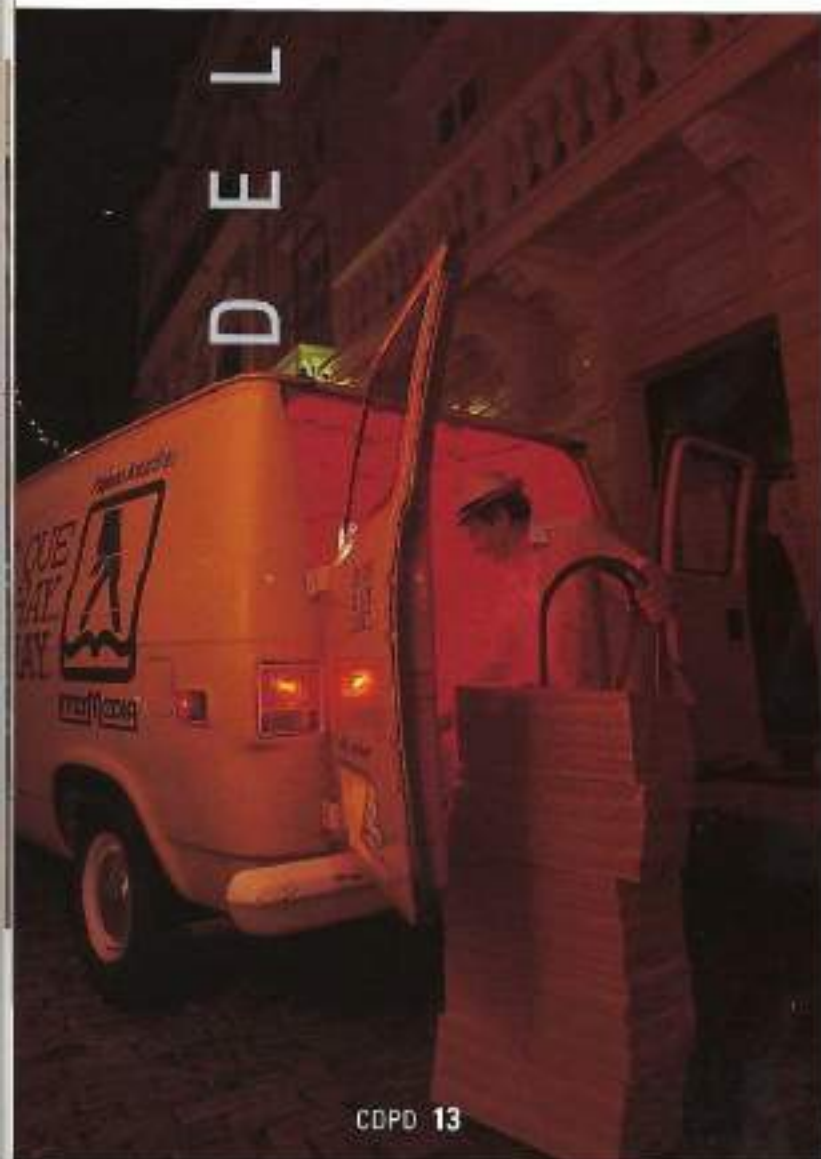
Practically every messenger in the United States wears a beeper. With CDPD, messengers no longer have to search for a payphone when paged. Wireless messaging features two-way communication that lets them respond immediately. The need to carry a beeper — along with additional monthly service fees — are eliminated.

With a CDPD mobile end system, messengers can process the entire transaction electronically, from order entry and pick-up to delivery and credit authorization for CODs. Time of delivery and even signature can be captured and transmitted in real-time to increase speed and accuracy. Order status and estimated time of delivery can be instantly communicated to inform customers that their shipments are on track.

Fleet management and intelligent vehicle highway systems enable efficient routing for speedier delivery. In-vehicle computers can warn drivers of traffic delays and provide directions for alternate routing. Bicycle and foot messengers can carry palmtop data devices so they can contact dispatch at any time from any location. This eliminates the annoyance of having messengers use the shipper's or recipient's phone to call for instructions or directions.

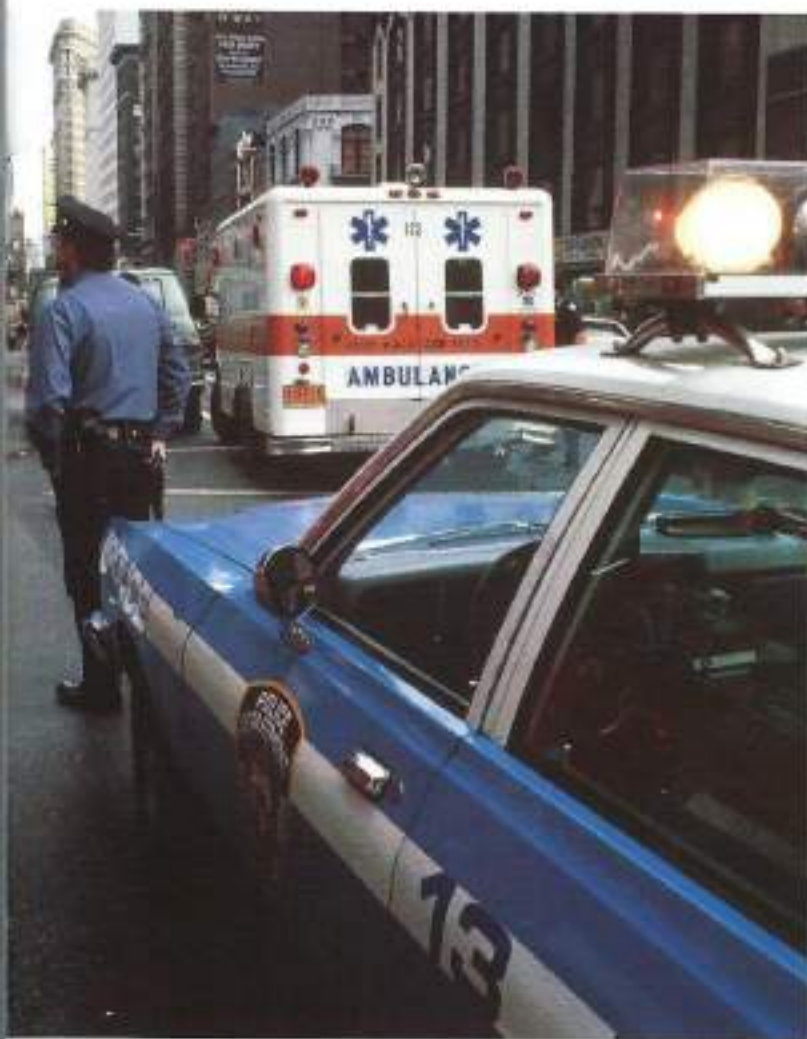
Many messenger services once viewed the new communications technologies as a threat to their business. In reality, CDPD can enhance their business productivity and profits as never before. Introduce them to CDPD, and you'll gain many new customers in this market segment.

DELIVERY





## Critical data for emergency services



*Police.*

*Fire.*

*Paramedics.*

When emergency services are involved, time is of the essence. And having unambiguous information available on the spot is critical—often essential to the preservation of life and property.

Various kinds of emergency services, both public and private, offer a large and growing market for wireless data. Emergency fleets, for example, need to be carefully managed, especially when a few minutes can mean the difference between life and death. Wireless data can provide these close tolerances. And the directions and alternate routes provided via wireless data communications can often be the critical difference that determines whether the crew gets there on time. Cellular voice keeps emergency team members in touch to coordinate schedules and activities.

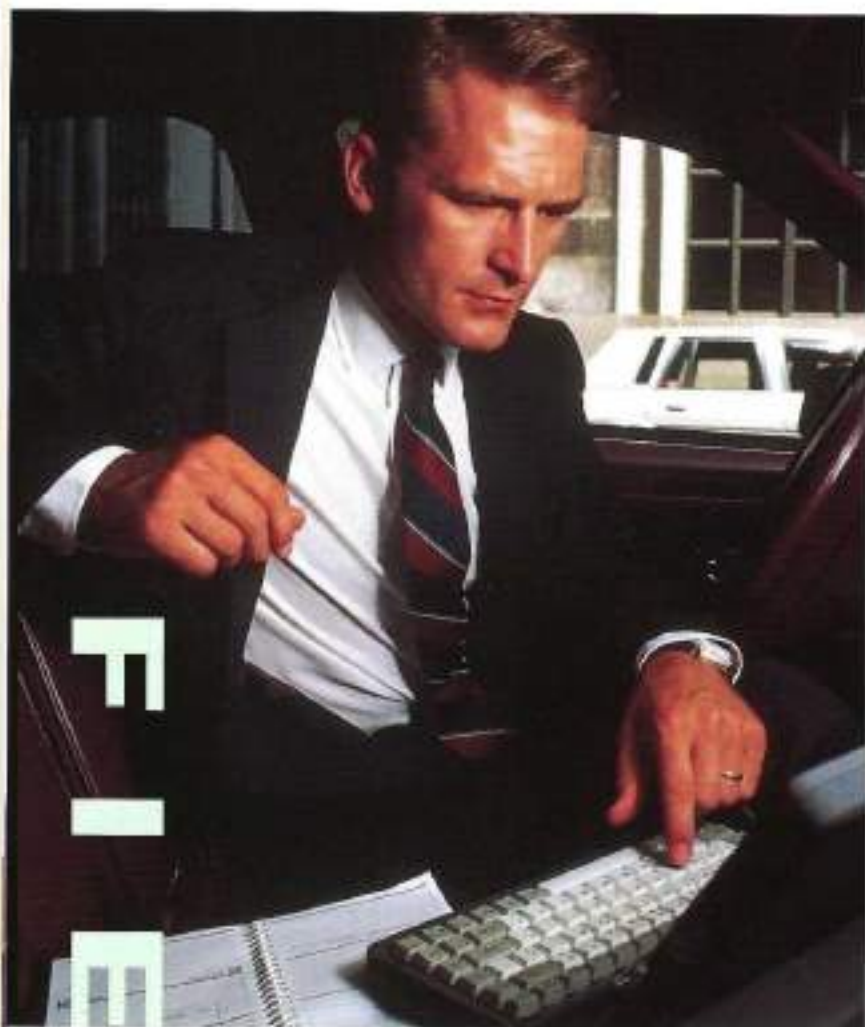
For police departments, wireless data is a useful tool. License plates, driver's licenses, traffic violations, outstanding warrants, restraining orders, and other data can be accessed at any location via wireless data.

Emergency medical services also find wide applicability for wireless data. Medical records, examination results, even read-outs from diagnostic equipment can be transmitted ahead to the hospital while the patient is still in the vehicle. Medical histories can be downloaded to alert paramedics about patients' allergies or other special problems.

In addition to more than 19,000 police departments, 27,000 fire departments, and nearly 7,000 ambulance and emergency medical services in the U.S., there are numerous other emergency dispatch applications for wireless data. These range from utility crews trying to restore power or fix downed lines in a storm, to the dispatch of snow plows during blizzards or rescue crews during floods. Why not come to their rescue ... and offer them both voice and data today?

# Emergency

## Selling wireless data to salespeople



America has a large number of companies which employ a total of more than 1.5 million field sales people. Most of them have complex data needs.

In addition, more and more professionals, technicians, and managers find themselves spending a good deal of time on the road

involved in sales-related activities. Mobile professionals and regional salespeople need constant access to communications — as is demonstrated by the growing number of cellular phones used by business people.

Wireless data provides the technology for field sales reps to stay in touch with the home office — and for sales management to gain control of field sales. Transaction processing capabilities provide field sales reps fast, affordable access to important corporate databases.

Speed and convenience are major advantages of CDPD over other technologies. For example, traveling sales professionals can use E-mail to communicate with clients and colleagues, sending anything from a quick thank-you note to a formal sales proposal. Product and sales data can be downloaded from the corporate database to instantly answer prospect questions or put together an ad hoc sales pitch.

Salespeople can use wireless data to manage schedules, routes, appointments, and quotations. Leads received at headquarters can instantly be transmitted to the sales reps, resulting in more rapid follow-up and a greater percentage of sales closed. Salespeople can use mobile end systems to access product literature, price sheets, and drawings, or generate a quote or contract, during calls. As a result, they'll be able to access a wealth of information their competitors can't. And better information means greater productivity and customer satisfaction.

For more and more customers today, increasing field sales productivity and results is a critical issue. You can help businesses make more sales ... by selling them on the benefits of CDPD.



## Useful tools for every utility

Public utilities — electric, gas, water, cable, and phone — have large field operations with sales, service, and inspection personnel on the road daily. There are more than 420,000 utility companies nationwide. These large organizations have communications needs that wireless data can fulfill.

Sending personnel out for meter readings is an ongoing expense for utility companies. Installing wireless telemetry units on meters reduces this expense, allowing status information to be transmitted over the wireless network. It also prevents billing delays or errors caused by missed readings. System usage is improved due to the ability to automatically monitor consumption.

Utility field operations can also profit from a range of transaction processing for mobile employees. Work orders, account status, credit, billing data, consumption, and other data can be downloaded to mobile end systems via CDPD.

CDPD systems enable utility workers to communicate using a variety of options including

voice, E-mail, and paging. In addition, utility companies can use wireless data to enhance fleet management, from scheduling and routing service calls, to coordinating fuel purchases and vehicle maintenance.

With oncoming industry regulation, "demand-side management" capabilities via wireless data can provide utilities with a competitive edge, enabling them to minimize service costs. Demand-side management also means the utility can provide the user with the ability to customize services to meet their specific needs.

Utilities earn extra profits today by offering add-on services ranging from home inspections and insulation to furnace cleaning and start-ups. With wireless data, utility workers can authorize these transactions and bill the customer's account right from the work site, maximizing revenues and cash flow.

Utilities are large businesses with sophisticated communications requirements. CDPD is the most powerful technology available for handling their wireless data applications — efficiently and cost-effectively.

# UTILITIES



## A real need for wireless data in real estate



Real estate is a huge industry, with 171,000 real estate offices nationwide employing hundreds of thousands of agents ... all of whom spend a substantial amount of time away from the office showing buyers properties. CDPD gives these real estate professionals a truly state-of-the-art mobile office.

To begin with, CDPD is a cost-effective electronic alternative to printed Multiple Listing Service (MLS) books. For about the same cost as a subscription to the paper directory, agents can access the MLS using portable computers.

While on the road, real estate agents can get complete facts on any house including listing price, taxes, size, and description. There's no need to return to the office to consult the MLS directory or access listings via their desktop PCs.

Best of all, the computer MLS database stays current, unlike printed directories which must be replaced every few weeks. And the agent can query the database, searching for just those listings that meet the buyer's specifications. The agent saves time, and as a result can show buyers more houses, resulting in more sales.

Mobile end systems can also be equipped with miniature digital cameras. Real estate agents can use these computers to photograph homes and record all selling information about new listings. The pictures and description can be sent via wireless data to buyers who can use their computers to access the latest information on homes of interest.

The fact that you can offer both data and voice on the same wireless infrastructure is also a plus to the real estate market. Real estate agents increasingly rely on wireless phones to keep in touch with the office and make sure properties are ready to show before driving buyers to the site. It also eliminates the annoyance of having to look for a payphone, or asking to use the seller's phone.

Practically every town has numerous real estate offices. CDPD gives you an advantage in tapping into this tremendous market.



# A growing need for wireless data

This applications guide lists only a sampling of the industries and applications for wireless data. What other opportunities exist in your service region?

**Virtually any business that has a mobile work force ... or provides sales, support,**

**and service ... or monitors remote systems or equipment ... or delivers and moves people, products, or packages ... or has professionals and managers who travel ... can benefit significantly from CDPD wireless data.**

**Take the next step in wireless data communications — today**

**CDPD is opening a whole new era in wireless communications:** the data era. Within a few years, the volume of data transmitted over wireless networks may exceed the amount of voice traffic. Already businesses in numerous industries are taking advantage of wireless technology.

Corporations today need state-of-the-art communications capabilities to remain competitive. At the same time, costs are always a concern. **You want to offer your customers leading-edge wireless data services** while increasing shareholder value. CDPD is the technology that can achieve all these goals.

**For more information, contact your AT&T representative.**

# Wireless Applications Summary



**Insurance**



**Trucking**



**Field Service**



**Taxi & Limo**



**Delivery Service**

## Electronic Mail

- Agent store & forward messaging
- Driver store & forward messaging
- Store & forward messaging

## Fleet Management

- Vehicle routing, scheduling of pick-ups and deliveries
- Scheduling of service calls
- Dispatch of technicians and parts
- Pick-up scheduling
- Vehicle assignments
- Pick-up and delivery scheduling
- Vehicle, personnel assignments

## Transaction Processing

- New policies
- Claims
- Order entry
- Status tracking
- Credit authorization
- Look-up for equipment specs, drawings
- Credit authorization for payment
- Order entry and status
- Work order updates
- Credit card authorization for fares
- Order entry
- Order entry
- Tracking of delivery status
- Credit authorization

## Telemetry

- Remote monitoring of equipment performance

## Messaging

- Customer messages
- Sales leads
- Driver contact
- Contact with field service reps
- Driver contact
- Messenger contact and updates

## On-Line Point-To-Point Communication

- File transfer of equipment specs, drawings, repair procedures
- Remote connection of test equipment

## Intelligent Vehicle Highway Systems

- Agent directions, best routes
- Directions, best routes
- Directions, best routes
- Directions, best routes, traffic updates
- Directions, best routes, traffic updates





## Emergency Dispatch

- Vehicle assignments, maintenance and repair scheduling

- Work orders, disaster communications, file look-ups (license plates, warrants, driver registration, criminal and medical records)

- Emergency personnel on call

- Field reporting
- Disaster equipment readouts
- Patient monitoring

- Directions, best routes, critical highway situations



## Field Sales/Professionals

- Sales bulletin/management
- Stay in touch with office
- Access customer/prospect messages

- Order entry
- Order status
- Inventory control
- Credit authorizations/collections
- Access databases
- Schedule appointments

- Contact field sales personnel

- Download/upload sales and customer files

- Directions, best routes



## Utilities

- Messaging store and forward for utility personnel

- Vehicle crew assignments
- Spare parts inventory tracking

- Order entry
- Work orders
- Order status
- Credit authorization
- Collections

- Remote meter readings

- Field employee contact

- Demand-size management

- Directions, best routes



## Consumer Markets

- Family contact

- Retailing buying/selling

- Home security

- Family helper contact
- Parent-child keep in touch

- Best routes
- Services
- Scenery
- Directions



## Vending

- Credit authorizations

- Machine service notices
- Sales information management



## Real Estate

- Agency store and forward messaging

- Customer messages, agent updates

- File transfers of listings

- Agents directions, best routes

# Yellow Pages

## CDPD of vendors

**A partial directory of companies that provide applications, mobile end systems, and other products and services for CDPD wireless networks.**

Company	Application	Contact / Telephone
Advantis	Connectivity to IBM-embedded systems from CDPD	Mike Abrams (813) 878-3634
Advanced Control Technology (ACT)	Fleet Management and dispatch	Jerry Stockweather (503) 967-8000
Airsoft	LAN file systems	Jagdeep Singh (408) 777-7500
Arrowsmith Technology	Field service applications for telephone and cable TV companies	Gary Schlumpf (512) 454-3554
Badger Computers	Rugged, portable laptops and handhelds which accommodate internal CDPD modems	Patrick Potts (813) 972-6607
Cincinnati Microwave, Inc. (CMI)	CDPD capable modems	Susan Shelton (513) 247-4482
Dauphin Technology	Notebook computers with optional CDPD radio modem package	Lucy Yong (708) 971-3400
Evolving Systems, Inc.	CDPD billing system	Ed Erickson (303) 689-2438
ICC International, Inc.	CDPD software solutions for transportation, utilities and maintenance management	Mike Wood (201) 267-6600
I-Net	CDPD capable modems; infrastructure software development	Lynn Hitchcock (214) 578-3930
InfoExpress	Wireless customized news delivery	Stacy Lum (415) 969-9609
Itronix	Ruggedized terminals	Tom Sperrazzo (800) 441-1309
IBM	CDPD communication package for IBM ThinkPad computers	Walt Shaw (914) 766-3891



Company	Application	Contact / Telephone
Melard Technologies	Mobile ruggedized terminals	Ali Sharif (914) 273-4488
Mobile Solutions	CDPD middleware; gateway for interoperability with other data networks; custom application development	G. Brian Kovalsky (301) 831-7155
Nettech Systems	CDPD network interface software tools	Don Grust (609) 683-0100
NovAtel	CDPD ready Cellular Radio Module	Patti-Ann Eidness (403) 295-4792
Pacific Communication Sciences, Inc. (PCSI)	Modem emulation gateway; CDPD capable modems; software developers kit for partnership with IBM	Mike Renuart (619) 535-9500
PRC Inc.	Application development; system integration services	Craig Ludington (312) 368-3697
Racotek	Wireless Systems Integrator	Stu Froelich (612) 893-3940
Roadshow International	Transportation applications	Todd Hedley (703) 790-8300
SEI	Manages/maintains remote route guidance databases by Navigation Technologies	Amy Hart (312) 251-5127
Sierra Wireless	CDPD capable modems	Andrew Harries (604) 231-1111
Software Corporation of America (SCA)	Customized CDPD applications; wireless application programming and toolkit	Shirley Eis (203) 359-2773
TEKnique	Gateway between CDPD and existing data services	Joseph Lee (708) 706-9700
Telepad	Rugged, laptop computers with digital camera and CDPD capability	Diana Lefcowitz (703) 834-9000
USEMCO	Software for mobile financial data and executing trades	Brian McCahery (212) 432-7000
VeriFone	Credit card swipe devices	Vincent Lee (415) 696-8935
Visual Link	CDPD real estate applications	Mark Bayliss (703) 667-6431
Wireless Connect	"Desktop" CDPD emulation system for applications developers	Patrick Glenn (408) 296-1546

The list of vendors shown is limited. Inclusion does not imply endorsement of the company or its products and services by AT&T.

For more information on how AT&T's  
CDPD products can enable you to add  
subscribers while enhancing quality and  
service, please contact your AT&T  
Account Representative or call:

1-800-344-0223 ext: 5048 (United States)

602-233-5895 (Outside United States)

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