

1 kind of thing that would encourage manufacturers
2 to stop their bickering and start producing
3 equipment. And so if, in fact, that's the case,
4 it sounds like maybe this is not a -- maybe it's
5 sort of a very efficient type of regulatory
6 structure.

7 MR. HALLER: Lex, can I ask a question.
8 That would be a modification on that just for your
9 comment. In a wonderfully written decision by the
10 Commission on TV/stereo, which I wrote, we decided
11 that any stereo technology could basically be
12 marketed, but if it was going to light a light on
13 a standard TV -- the consumer TV, that it had to
14 comply with certain standards. And, therefore, we
15 did not limit the technology in any way; anything
16 that could be put on the air was okay providing it
17 didn't cause interference to other TV operators.

18 But on the other hand, the consumers had
19 some knowledge as to whether they were listening
20 to a standard TV/stereo signal. Now that -- as
21 far as I can tell, TV/stereo, in fact, all kidding
22 aside, has been a big success. With that kind of

1 approach, would that be appropriate here?

2 MR. FELKER: Well, let me offer this
3 commentary. My recollection -- and correct me if
4 I'm wrong about this, Ralph, in the TV/stereo
5 decision there was a standard in industry. There
6 were other sorts of things boiling around. I
7 remember there were two or three others that were
8 competing to be a standard but ultimately EIA
9 signed off on one, I believe, and what the
10 Commission did was sort of endorse that as sort of
11 a de facto meeting the requirements but allowed
12 others to go forward.

13 And so in that particular case that may
14 have been a good way to proceed. And, you know,
15 the results seem to indicate it was a good way to
16 proceed. But for PCS, it's a little bit
17 different. We don't have the sort of consensus on
18 a particular standard. In fact, there are, you
19 know, four -- I don't know what the number is.
20 There's a number of ones that, you know, look
21 pretty interesting depending on what kind of
22 application you're interested in and where it is

1 on the development curb and whatnot. So it's not
2 clear to me that particular approach would work.

3 And let me just add one little extra spin
4 on this, and this goes to, I think, the point that
5 John just raised about, you know, the No. 1 button
6 on the handset doing X on some manufacturer's
7 systems and Y on another. I mean, that's the
8 level of detail that really has to occur, I think,
9 on these new digital systems, because you want to
10 have uniformity. You want to be able to -- you
11 know, you're going to a mass market now, sort of
12 like a consumer market for TV/stereo. And so you
13 want to be in a position that, you know, all the
14 handsets operate in a common fashion. And I think
15 that's what we're getting at. We're not saying
16 it's 1.25 megahertz with a particular chip rate.
17 It's a much more sort of implementation level
18 standard that we're trying to get at.

19 MR. STANLEY: That's real -- that is not
20 guaranteed by a common area or a standard. That's
21 goes beyond that. Generally the view point is
22 that -- Irwin.

1 DR. JACOBS: That would be beyond the area
2 of air-interface standard. It maybe on subscriber
3 equipment but it also gets very difficult because
4 the air-interface -- or the human-interface is
5 going to be one of the interesting things. I
6 would hope that, in fact, we're moving in the
7 direction of simplifying it sufficiently; that all
8 of these complications that we've seen in the past
9 very much get minimized.

10 There is one other aspect, though, on the
11 air-interface and that's -- and I can't -- I
12 guess I wouldn't have imagined myself arguing in
13 favor of some type of standard for requirements
14 after having gone through all the effort over the
15 last few years but there is a great use to it.

16 And another one -- another area that could
17 be coming up is the fact that as you get a number
18 of systems, a number of different bandwidths, a
19 number of regions of various sizes, this
20 interference issue between the technologies needs
21 to be looked at much more carefully than it has
22 been in the past, and I think this the FCC can

1 easily do. And so as part of the standards
2 process, this issue, I think, needs to be examined
3 more carefully.

4 And so I think there is, again, an argument
5 not for specifying a system or a particular
6 standard but that they'll be one or more such
7 standards that are used.

8 MR. STANLEY: Since the principal standards
9 in the cellular arena -- and I don't know the full
10 standard development at one point of 1.9 -- since
11 they're already fairly well into what I'll call
12 some standard setting, isn't this -- couldn't this
13 be construed as an approach that would penalize
14 those late comers? For example, those who could
15 be held hostage in the standard setting arena by
16 manufacturers who are already fairly well into
17 it?

18 MR. BATTIN: I think what we see happening
19 is that it's been heating differently than
20 cellular. We got into a lot of trouble on digital
21 with cellular primarily because we were trying to
22 develop one standard. So we had the CDMA people

1 and the TDMA people in the same group and that
2 made a deadlock, you know, for some period of
3 time.

4 Now, you know, I see that we can have a
5 group of people that are -- or a group of industry
6 that is working on a CDMA standard, we're going to
7 have someone doing a TDMA standard, people will be
8 doing a GSM standard, we have a microcell
9 standard, and so within those groups I think it
10 will move very efficiently.

11 One thing that I wanted to put in here is
12 that maybe the most key thing to remember about a
13 standard is documentation; that if there is no
14 standard, there is no benchmark for
15 documentation.

16 You know, as Motorola I could put a system
17 on the air in Boston, sell it to a customer -- not
18 that I have one, at least this point today -- and
19 no one would know anything about that system
20 outside of the fact of FCC's requirements on ERP
21 and a couple of other things.

22 So I think a key thing in having a standard

1 is to force a level of documentation so that other
2 manufacturers and other systems can pick up that
3 technology and come promote it across the
4 industry.

5 MR. STANLEY: Okay, thank you. Don, you
6 wanted to ask a question?

7 MR. GRINDSTAFF: Tom, can I make one
8 comment?

9 MR. STANLEY: I'm sorry. A brief one,
10 please.

11 MR. GRINDSTAFF: We believe that the
12 process is in place, the multiple standards, but I
13 also believe or I agree with what Irwin was
14 saying; that when you have these different
15 technologies coming off from the standard bodies,
16 there needs to be something or some guidelines
17 that assures that the interoperability between
18 systems can happen and that there's no
19 interference between systems.

20 If you look at cellular today -- a good
21 example is our system in Los Angeles and
22 San Diego, two different MSAs, and there is

1 interference, because we use the same frequency
2 and they have to be coordinated. When you have
3 multiple standards and multiple PCS operators,
4 there needs to be some assurance that these
5 technologies are put in place, aren't interfering
6 with each other, and also that if a user in
7 Chicago goes to New York, that the consumer wins
8 out; that the handset will work on that type of
9 system. And I think possibly that the license
10 literature or the writing on the license when you
11 give them out requires some minimal, technical
12 requirements of standards of interoperability or
13 911 type of services. Just these minimal
14 requirements to enforce the industry to make sure
15 that they have addressed these issues. I think if
16 we don't do that, that there's a possibility that
17 some operators and some manufacturers may go off
18 on a different track.

19 MR. STANLEY: That may be desirable but
20 somehow I guess even addressing the technical
21 standards goes fairly far towards
22 interoperability.

1 MR. GRINDSTAFF: Right. Right. And I
2 think what guarantees it is if you require the
3 licensee to -- if they're going to have PCS
4 systems across the country, a similar type of PCS
5 system, it doesn't mean everybody has to use that
6 PCS system; that they require some
7 interoperability capabilities.

8 MR. STANLEY: In terms of Irwin's point
9 about interference, say, between technologies, who
10 really should be pounding out that kind of a
11 requirement in terms of specifications? It's
12 certainly not us.

13 MR. GRINDSTAFF: I understand everybody
14 should be addressing that, but I think it may be
15 more convenient to have the Commission specify to
16 the industry that they to have that in there.
17 This is similar to what happened in AMPs in '79.
18 There were minimal requirements put down for AMPs
19 operators that they had to meet, and these same
20 minimal requirements should be put into PCS
21 licenses.

22 MR. STANLEY: Okay, thank you. Donald.

1 MR. GIPS: I'm trying to struggle with the
2 role that designated entities are going to play in
3 the PCS, and in Lex's presentation he said that to
4 compete with existing cellular providers, new PCS
5 providers are going to need significant spectrum,
6 and yesterday we heard that new PCS providers are
7 going to need deep pockets to be able to do that
8 and preferably an existing communications
9 infrastructure.

10 Given that, I'm curious, Mr. Murray,
11 whether you think designated entities will be able
12 to compete in that application of PCS or do you
13 see them completing in different applications of
14 PCS?

15 MR. MURRAY: Competing in what again now?
16 I didn't understand the question.

17 MR. GIPS: Do you see designated entities
18 competing in the cellularlike arena with the
19 cellular incumbents in PCS, or do you see them
20 offering different types of services in PCS?

21 MR. MURPHY: Well, I think there are some
22 niche markets that are clearly available for the

1 designated entities to participate in. I think
2 they can do either or, actually. I think they can
3 compete against or they can satisfy a niche
4 market.

5 MR. GIPS: Here is where I'm struggling
6 with the question. We heard yesterday that 30
7 megahertz is probably -- there's disagreement but
8 the new PCS provider had believed that 30
9 megahertz is necessary to compete with cellular.

10 How can the DEs compete with cellular with
11 less than 30 megahertz if that's true?

12 MR. MURRAY: Compete with cellular with
13 less than 30 megahertz? Well, I'm not sure.

14 MR. GIPS: Let me phrase the question a
15 little differently.

16 What can we do to make them more viable yet
17 still allow for competition with cellular the way
18 that Lex has said that we have to provide it?

19 MR. MURRAY: Well, to make them more viable
20 I think that with the 30s in place, the MTAs, I
21 think that is a detriment to any -- if you put the
22 designated entities in the 20s and the 10s, then I

1 think by the 30s MTAs gaining early entry into the
2 market place and the 20s and 10s having to deal
3 with the microwave issue, I think they're clearly
4 at a disadvantage at that point.

5 But if you take the two 30s and make three
6 20s, then I think the playing field -- I mean, for
7 lack of a better -- the competition aspect of
8 allowing a designated entity to then be able to
9 buy a 20 or utilize the 10s, the competition is
10 much greater at that point. And I as an investor
11 in a 20 or a 10 believe that I have a much better
12 chance of having a successful business than I
13 would if I were to try to go up against a 30.

14 MR. GIPS: And you don't see the incumbent
15 cellular providers as stiff competition for you at
16 your 20?

17 MR. MURRAY: Well, I think it increases the
18 price in order to get them out of the -- to
19 eliminate the interference.

20 MR. GIPS: No, I'm sorry. The incumbent
21 cellular providers, you don't see those as
22 competition?

1 MR. MURRAY: No. I mean, if they pick up
2 another 10 and I can aggregate up to a 30, then I
3 think I'm just on equal footing as well as they
4 are.

5 MR. GIPS: Does anybody else want to
6 comment on DEs?

7 MR. GRINDSTAFF: Yeah. I sat through
8 yesterday's session. I think what a PCS operator
9 needs is really a good business plan. And if he
10 has a good business plan and if he knows what his
11 business is and he has a market segment, he's
12 going to go for it; it's regardless of the amount
13 of the spectrum.

14 For example, we were in the UK. We had
15 three licenses and we were going to be given up to
16 50 megahertz. It actually started out to
17 15 megahertz. We pulled out of that. Three of
18 the licenses went down to two licenses and they
19 have struggled.

20 So it's not a matter of how large the
21 spectrum is. I think it's the market economies.
22 And when you look at the different markets across

1 either MTAs or BTAs, each one is going to be
2 uniquely different. So there are some cellular
3 markets today that can't support two cellular
4 operators.

5 MR. HALLER: Are there -- along the same
6 lines, are there advantages or disadvantages to a
7 geographical area of licensing? I'm asking that,
8 I guess, from a technical standpoint. Is it, in a
9 sense, cheaper per square mile to build out an MTA
10 than a BTA, or how should we view the geographical
11 licensing area with regard to, one, the ease, and
12 two, generally? Because yesterday that was
13 covered a lot, though a couple of you touched on
14 that on this panel so I would be interested in any
15 comments you have.

16 MR. GRINDSTAFF: From our studies we
17 support the BTAs, and the economics for the BTAs
18 are much better than the MTAs. The cost of the
19 license for the MTAs really puts your business on
20 the negative for a lot longer than the BTAs where
21 the license we believe will be less expensive and
22 that you can concentrate your business for the

1 servicing area you want.

2 We also believe that MTAs do not promote or
3 use -- or promote the service to rural areas
4 because if MTA providers are going to be so
5 strapped because they spent so much for the
6 licenses, they're going to concentrate on the
7 metropolitan areas and basically write the rural
8 areas off that need probably some support of
9 economics to build out there.

10 MR. PEPPER: If I could just follow-up on
11 that for one second. If under a current plan -- I
12 assume what you're arguing is that in order to
13 provide the service to rural areas, they should
14 all be BTAs. If that were the case and we didn't
15 change the plan, we would have seven licenses in
16 rural areas. Do you really think that there would
17 be seven licenses built out in rural areas?

18 MR. GRINDSTAFF: No. I also don't think
19 there are even seven licenses and even MTA areas.
20 You might not see that either. I think PCS is
21 going to be very competitive. I think all the
22 wireless businesses are going to be very

1 competitive. So that when you're looking at two
2 incumbent cellular and the SMR and seven new
3 operators come in, the PCS operator has to make
4 sure he knows what he's doing before he goes out
5 there and deals with a slightly --

6 MR. PEPPER: Let's say there's two more.
7 Do you see there being five full-service
8 competitors in rural areas?

9 MR. GRINDSTAFF: I think it depends on the
10 rural area and what the market segment is and what
11 the PCS operator is going to do. I mean, if
12 you're looking at PCS as just being cellular and
13 looking at PCS as local loop or wireless access,
14 those are different market segments they can
15 support -- that can be supported by the market.
16 But if everybody is going for the same thing, it's
17 just like any business; if you're getting a lot of
18 services, the prices go down and some businesses
19 don't make it.

20 MR. FELKER: To sort of respond to your
21 question, Bob, I think sort of on average you
22 would expect in rural areas that, you know, an MTA

1 provider at least has a better shot of being
2 viable than a stand-alone BTA operator simply
3 because it's a question of marginal versus fixed
4 cost. I mean, you're sticking the cover -- you
5 know, a small rural BTA, you're talking about a
6 relative -- you know, a handful of base stations,
7 maybe only one, with all the back office
8 functions, all the network infrastructure and
9 everything else, sort of trumped over to, you
10 know, the major metropolitan areas. So you have a
11 chance to share a lot of your facilities that are
12 being paid for -- the average cost which is being
13 paid for by the higher usage area.

14 So I think -- you know, in looking at this,
15 there just are scale economies which come into
16 play when you're talking about wire areas. And,
17 you know, the only way to capture that is to issue
18 licenses across broader areas.

19 MR. PEPPER: So your answer to Ralph's
20 question is that there are, maybe not technical
21 reasons, but economic reasons --

22 MR. FELKER: Yeah.

1 MR. PEPPER: -- to the geography as it
2 affects the economics?

3 MR. FELKER: Yeah. Yeah. I guess I sort
4 of disagree with what Limond says. If the license
5 costs more for an MTA than it does to try to build
6 it up over BTAs, then that means it's worth more,
7 and why is it worth more; because their scale
8 economy is.

9 MR. PEPPER: Chuck?

10 MR. JACKSON: I was just nodding in
11 agreement with Lex, but I want the record to show
12 that I disagree with them on almost everything.

13 DR. JACOBS: Just again on this question of
14 the bandwidth, again, initially the main issue is
15 not going to be using all your bandwidths. You're
16 not going to have enough customers to do that. So
17 you're going to have to clear out a small amount
18 of bandwidth. You're probably not going to use
19 even 10 megahertz; you're going to use the smaller
20 part to get started.

21 The issues that come up on rural and urban,
22 there is an economy of scale but there are various

1 ways of getting that economy scale. I would guess
2 that there might also be some services that would
3 spring up that would provide for a variety of
4 these capabilities and network interconnections,
5 et cetera, for a number of these small areas if
6 you want the licenses to the BTAs, so that one can
7 see different types of companies coming into being
8 as a result of this effort.

9 MR. STANLEY: I guess another way to ask
10 the same set of questions is along the following
11 lines: It's the Commission's allocation from last
12 year, the block plan, was fairly heterogeneous in
13 terms of 30s, 20s and 10s and MTAs and BTAs.
14 Would you argue, I guess, for more or less
15 homogeneity in this? For example, it's been
16 certainly recommended that an ideal cut would be,
17 say, three MTAs, three 30s at the MTA level.
18 Others feel, say, six 20s at the MTA level. Some
19 go down to six 20s at the BTA level.

20 Considering what we did was largely
21 homogeneous, how would you suggest -- how would we
22 improve the decision? Lex.

1 MR. FELKER: Well, I think certainly based
2 on what we heard yesterday, and which many of the
3 comments today are sort of not inconsistent with
4 that, I think there's a question as to how many
5 additional PCS operators are going to be viable.
6 And if that's the case and one doesn't want to
7 waste spectrum, or other resources for that
8 matter, in trying to arrive at whatever the right
9 answer is, certainly my recommendation would be to
10 consolidate the lower band into a smaller number
11 of larger bandwidth assignments and licensing on a
12 very wide-area basis.

13 MR. HALLER: Can I ask you a question which
14 is kind of related but it gets to a slightly
15 different issue as well? We heard a lot yesterday
16 from some, but not all, that people with an
17 existing infrastructure, whether it be cellular or
18 whether it be cable or whether it be wireline, had
19 an advantage to getting off the ground on PCS, and
20 I'm wondering if you could address that issue
21 specifically with regards to cable. Most cable in
22 this country I believe today are still one-way

1 cable.

2 Given that that's the case, do the cable
3 television companies, in fact, have any kind of
4 particular advantage in getting into PCS with that
5 kind of infrastructure in place?

6 MR. FELKER: Well, since you narrowed the
7 assumptions going into that question --

8 MR. HALLER: Well, I'm asking if they're
9 right.

10 MR. FELKER: Yeah. I think -- certainly
11 our company and other large MSS are rapidly
12 rebuilding their cable infrastructure to support,
13 you know, a more robust video business, and these
14 wire bandwidths, fiberoptic systems are much more
15 reliable than the frequently two way -- certainly
16 two-way ready. So I think those systems are --
17 will be capable, and probably in the time frame
18 that licensing, equipment and microwave moveout
19 occurs, to support PCS in some sort of transporter
20 or back-all application.

21 That having been said, the analysis that
22 we've done suggests that cable and other existing

1 facilities provide -- certainly provided an
2 advantage on an ongoing basis in terms of the
3 expense and perhaps some advantage on Cam X, but
4 it's not the kind of thing that makes or breaks
5 the business. It makes it more attractive, and in
6 some cases makes it much more attractive, but it's
7 not a sort of a make or break kind of deal.

8 MR. HALLER: Yes.

9 MS. ABRAMSON: I would like to address
10 Dr. Stanley's question about the homogeneous
11 nature of the spectrum allocation.

12 From UTAM's perspective we would like to
13 note some caution here. We would not like the
14 unlicensed band to become the sacrificial lamb
15 where some of the spectrum is removed for the
16 licensed operators. I commented on our forecast
17 for the unlicensed band and we feel that we do
18 need at least those 40 megahertz.

19 So in considering what you do for us, for
20 license, our comments are don't take it out of the
21 unlicensed band.

22 MR. GRINDSTAFF: I would like to make one

1 comment on that, also, and I would like to agree
2 with Lex, at least on one word, and that's
3 consolidation. And where we're coming at is that
4 the BTAs would allow the industry to consolidate
5 as opposed to giving out MTAs and forcing
6 consolidation of the areas; that BTAs would allow
7 PCS operators to get up and operate and
8 consolidate where it makes sense. And it's a
9 building-block approach which allows more
10 flexibility of the PCS operator.

11 On the various spectrum allocations, we see
12 that as being very positive for innovation, and if
13 you vary the spectrum blocks such as in the 2100
14 megahertz range, you can do the same services as
15 the other blocks but you can also do other
16 services, and by having varying spectrum blocks
17 you may -- I hate to use the word "force," but
18 maybe make PCS operators think about other things
19 and provide new PCS services that we haven't
20 thought of yet.

21 And I agree that the unlicensed band where
22 its located has tremendous possibilities and

1 opportunities of providing new innovation that can
2 be very easily interoperable with the 1800 license
3 spectrum band.

4 MR. STANLEY: Let --

5 MR. GIPS: Can I ask a follow-up on that?
6 Won't it take two radios and any phone to work
7 between the unlicensed and the licensed band given
8 the different etiquettes and power ranges?

9 MR. GRINDSTAFF: Right, but when you go
10 from one frequency band to the other frequency
11 band, it takes two physical radios, RF. When
12 you're down in the 1800 and the unlicensed band is
13 right next to you, you only have one RF section so
14 you just -- you're basically just stepping over to
15 the unlicensed band, and then you go to a TDD or a
16 nonduplex operation, which is much easier and much
17 simpler to intergrade into a dual mode type of
18 phone.

19 MR. GIPS: Can any of you address the
20 difference in cost penalties between a handset
21 that works from the current unlicensed band to the
22 1800 band and a handset that works from the

1 current unlicensed band to the 2100 band? What's
2 the difference in cost to produce those two
3 different handsets?

4 MR. BATTIN: I think this somewhat depends
5 on the technology that you use, but I think in
6 most of the technologies it's relatively
7 inexpensive. Maybe it's 5 or 10 percent to have a
8 subscriber unit that can interoperate in
9 unlicensed band, you know, let's say within the
10 one dot eight range. But shifting up to two dot
11 one, you know, it's probably in that 20 to 25
12 percent range.

13 If you want to think about this, when we
14 have a transmit band maybe below 1.9 gigahertz and
15 a receive band above -- or the other way, the way
16 we separate that is with frequency select
17 developments and we transmit and receive on the
18 same antennas. So you separate those signals with
19 some frequency selective developments. The moment
20 you say, okay, now I'm going up to 2.1, it's not
21 just a matter that you have to go RF devices to
22 operate 200 megahertz higher. That's not the