End to end routing behavior in the Internet

1.No. Asymmetric routing in general is a normal, but unwanted situation in an IP network. Asymmetric routing is a situation where for one reason or another packets flowing in i.e. TCP connections flow through different routes to different directions. As a rough example: Host A and B located in different continents are communicating through a TCP connection. Segments sent from host A to host B reach the destination through Sprint link but segments sent from B to A reach the destination through MCI link.   
Asymmetric routing as described above is not a problem for current TCP/IP implementations, since TCP connection does not care which route a certain IP packet takes as long as it reaches its destination in a reasonable time.

2. In 10 of the traces (0.16%) and 155 of the traces (0.44%) the author observed routing connectivity reported earlier in the traceroute later lost or altered, indicating they were catching a routing failure as it happened. The distribution of recovery times from routing problems is at least bimodal—some recoveries occur quite quickly, on the time scale of congestion delays (100’s of microseconds to seconds), while others take on the order of 1 minute to resolve. They suspect the different modes depend on whether the change is due to a new route becoming available, in which case the outage spans only the amount of time required to process the new routing information and update the forwarding table; versus an existing route being lost, and the outage reflecting having to wait for the change to propagate through the network and an alternative route to be found. The latter type of recovery presents significant difficulties for time-sensitive applications that assume outages are short-lived.

There are two types of stability: “prevalence,” meaning the overall likelihood that a particular route is encountered; and “persistence,” the likelihood that a route remains unchanged over a long period of time. We find that Internet paths are heavily dominated by a single prevalent route, but that the time periods over which routes persist show wide variation, ranging from seconds up to days. About two thirds of the Internet paths had routes persisting for either days or weeks.